The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXVIII, NO. 3 CHICAGO, ILLINOIS JANUARY 20, 1917

VACCINE THERAPY

ITS POSSIBILITIES AND LIMITATIONS *

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A discussion of the possibilities and limitations of any topic involves more or less prediction. In science it is dangerous to predict and especially is this so just now concerning the subject at hand, because we are in the midst of a revolution in methods and in interpretations as applied to this field. It is with reluctance, therefore, that I attempt to present this subject, because I feel it cannot be done adequately at this time.

After an attack of many infectious and contagious diseases, such as typhoid fever, smallpox, measles, scarlet fever, the body becomes for a long time highly resistant to the given disease, but not to any other disease. The conception of specificity is here clear and definite.

Many years ago Jenner found that smallpox in the modified and relatively harmless form of cowpox could be given to human beings and that they were then almost as resistant to smallpox as if they had had the disease.

Pasteur, years later, showed that by injecting into animals certain modified living viruses (chicken cholera and anthrax) the animals then became resistant to natural infection and also to experimental infection with that germ. This was true, however, of certain viruses only. The injection of the virus of many other diseases did not so protect against subsequent infection.

Later, Pasteur in his great work on rabies took advantage of the long incubation period in this disease and by the early injection of the modified virus contained in the spinal cord of infected rabbits was able to protect animals and man against the fatal outcome sure to follow in case symptoms once appeared. This method, it is important to note, is in reality protective and not curative, because it is not effective if begun late or after the first symptoms have set in.

Based on such experimental and clinical facts, which accumulated rapidly following the work of Pasteur, animals and man were given dead or modified living germs for protection in a variety of diseases. Up to the present time this method has been used with marked success in man in typhoid fever and with some, but less definite, success in plague and in cholera. In animals, in symptomatic anthrax, swine erysipelas and rinderpest, marked success has been attained.

For certain few diseases, then, the prophylactic use of specific vaccines has been thus far successful in both animals and man, but in the great majority of infections it has not been successful to any appreciable degree. I wish to emphasize this point because it is in prophylaxis that we have the most favorable conditions possible, according to our fundamental principles of immunity, for the action of vaccines. However, the marked success that has attended their use in such diseases as above enumerated establishes a practical and rational basis for their possible value in all infections. Whether or not they will be efficacious in a given disease will of course have to be determined in each instance.

I have referred to the above facts concerning prophylaxis because of their bearing on the curative use of vaccines. A priori, on the basis of immunity principles, we could hardly expect to obtain better or even as good results when the virus is introduced during the course of the disease as when introduced previously. What are the facts?

It was early observed that vaccination with cowpox virus during or after the onset of smallpox had no effect on the course of the disease. Pasteur was well aware of the possibilities of a curative therapy as well as of a prophylactic one, but he reports no results of importance along curative lines. Even to this day it is interesting to note that in the domain of animal diseases, which have been so fertile in furnishing valuable data for prophylactic therapy, there are no natural diseases known in which vaccines for curative purposes have been of any appreciable value. Indeed, there is empirical evidence that vaccination just before or during an attack of a disease may do harm. Veterinarians are careful not to expose cattle to infection soon after they have received prophylactic anthrax vaccine.

Koch's work on tuberculosis in 1890 was perhaps the first serious attempt to apply vaccine therapy to the human and it was, as we all know, a failure at that time. Scores of attempts with almost every imaginable modification of the bacillus, including extracts and bodies, have since been made. Biggs states that treatment with tuberculin on the whole is being gradually given up in this country. This is after a trial of twenty-five years. It should not be understood from this statement that such treatment has no virtue whatever. Trudeau's results would seem to indicate that when used discriminately tuberculin has some value perhaps in immunizing against the toxin. A curative vaccine against the bacillus has, however, not been found.

Fraenkel in 1893 used subcutaneously dead typhoid bacilli in the treatment of typhoid fever, with what he

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* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

considered good results. Rumpf shortly after claimed as good results when pyocyaneus bacilli were used in typhoid, thus very early questioning the specificity of vaccine treatment. In recent years many reports have appeared dealing with this subject, the results being somewhat conflicting. Beginning with the use of intravenous injections by Ichikawa in 1912 and by Gay and Chickering soon after, the treatment of typhoid, on account of termination by crisis in a considerable proportion of cases (30 to 40 per cent.) thus treated, has excited much interest.

Wright in 1902 inaugurated a new era in the use of vaccines by his discovery of opsonins. This subject is so well known I will not enter into detail. As contrasted with Koch's and Fraenkel's work, it attempted to place the use of bacteria and their products in the treatment of disease on a rational basis, controlled by a carefully determined standard, the opsonic index. According to Wright, vaccines were suitable in certain subacute and chronic infections, the object being to stimulate the protective agencies of the body in order to rid it of localized and perhaps more or less protected foci. Acute infections were not considered suitable for the use of vaccines, though it should be stated that from time to time reports appeared indicating that good results were occasionally obtained in acute cases. Such results were not altogether in harmony with Wright's theoretical conceptions, because in severe acute infections the defenses of the body were considered already overwhelmed and vaccines merely added to this toxemia.

Wright's work has been based on the principle of specificity, as was nearly all the work on this subject before his time. It is interesting here to note how thoroughly this principle has dominated the thought of men since the beginning of the bacteriologic era. The idea of specificity rests on an absolutely secure basis of clinical and experimental facts. Yet it is perhaps not an overstatement to say that for many workers it has become a dogma. Wherever the principle seemed to apply it was not thought necessary even to use controls in the observations. So in the therapeutic application of vaccines, if good results were obtained, it was taken for granted that this was dependent on the specific effect of the vaccine and no thought was given to the possibility of other vaccines or substances producing the same effect. This was due, I think, largely to the very indefinite results obtained by the subcutaneous use of vaccines in many diseases. For since the intravenous use of vaccines and other products, decidedly more definite results are possible and control observations with numerous substances can more readily be made.

Following the work of Wright, careful and scientific as it was, there occurred a flood of commercialism in connection with the preparation of vaccines and bacterial products of all kinds. Apparently it matters little in this age what the therapeutic agent may be, if it is possible to commercialize it, this will be done. The abuse of these products has been discussed so well and so recently by Pearce, Theobald Smith, Hektoen, Billings and others that I will not dwell longer on this point.

Scattered throughout the literature are the reports of more or less isolated observations that in the treatment of infections, both acute and chronic, good results have followed the use of nonspecific substances. Though many of these reports are quite definite, indeed some decidedly more so than those obtained by specific therapy, since they did not appear to be in keeping with the dominating conception of specificity, they were regarded with skepticism or indifference. This subject has very recently been thoroughly developed and the specific facts stated by Jobling and Petersen.[1] The problem largely centers around the toxic effect of colloidal substances, especially the foreign proteins, on injection into the body.

The favorable results first reported by Kraus, Ichikawa and others by the intravenous injection of typhoid vaccine in typhoid fever were soon followed by the further reports of Kraus, of Luedke[2] and of J. L. Miller[3] that equally good results could be obtained with other substances, such as colon vaccine or even with solutions of proteins, albumose, etc., in this infection. Mueller and Weiss[4] have obtained striking results in arthritis, especially gonorrheal arthritis, by the intragluteal injection of sterile milk and of sodium nucleinate, both of which substances cause a marked reaction. Smith[5] calls attention to the value of an anaphylactic reaction, in gonococcus infections obtained with horse serum, normal or antigonococcic, it matters not, provided the allergic phenomenon is manifested. Miller and Lusk[6] report striking results in acute, subacute and chronic arthritic conditions of various types by intravenous injections of typhoid vaccines and proteose.

In our laboratory Culver, engaged recently in this work, reports that in the treatment of gonorrhea and its complications, especially arthritis and epididymitis, with the intravenous injection of bacterial suspensions, there seems to be no specific reaction when gonococci are used as compared with other organisms. The results have been very pronounced in most cases, marked relief following a single injection. The suddenness of the reaction and the severity as characterized by chill, high temperature and leukocytosis are more marked following the injection of meningococci than following either gonococci or staphylococci. The improvement seems to be in proportion to the temperature and leukocytic reactions. As to recurrence of the infections, nothing can be said at present as sufficient time has not yet elapsed.

Mathers,[7] working especially on lobar pneumonia and erysipelas, reports that these infections have been treated during the acute stage by intravenous injections of various vaccines and protein solutions. Suspensions of typhoid bacilli, pneumococci, staphylococci and streptococci have been used, as well as normal horse serum, diphtheria antitoxin and various protein solutions, both animal and vegetable. All of these substances, when used in sufficient dosage, may give rise to a characteristic febrile and leukocytic reaction which in some instances was followed by a temporary clinical improvement. No evidence has been gained, however, which would indicate that the specific vaccine in these diseases excels in any way the nonspecific antigen. Mathers infers from his experience with erysipelas and pneumonia that the therapeutic results from this method of treatment do not warrant the general application of this method. He has also observed that citrated human blood produces a reaction

1. Jobling, James W., and Petersen, William: The Nonspecific Factors in the Treatment of Disease, The Journal A. M. A., June 3, 1916, p. 1753.
2. Luedke: München. med. Wchnschr., 1915, **62**, 321.
3. Miller, J. L.: Illinois Med. Jour., 1916, **29**, 8.
4. Mueller and Weiss: Wien. klin. Wchnschr., 1916, **29**, 249.
5. Smith, L. D.: The Value of Anaphylaxis in the Treatment of Gonorrheal Complications, The Journal A. M. A., June 3, 1916, p. 1758.
6. Miller, J. L., and Lusk, F. B.: The Treatment of Arthritis by the Intravenous Injection of Foreign Protein, The Journal A. M. A., June 3, 1916, p. 1756.
7. Unpublished data.

similar to that described above when injected intravenously in amounts usually advised in transfusions.

Since these very striking results have been obtained by the use of nonspecific protein substances, the specificity of treatment with serums in pneumonia and other infections and with vaccines, especially in typhoid, as reported by Gay, and in the many other diseases in which apparently good results have been obtained, may be called into question.

My own experience with vaccines, which began in 1904, has included a variety of infections, both acute and chronic. I have observed in certain cases, especially arthritic cases, and also in some colon infections, definite reactions, with chill, fever, leukocytes, etc., followed by a striking improvement. This experience, I think, has been a common one, especially by those who have used large doses as well as small doses of vaccine. Naturally, the interpretation usually given to such reactions has been that they were specific responses on the part of the body to its autogenous virus. In the light of newer facts we are inclined now to view such reactions as probably nonspecific and of the same nature as those following injection of any foreign protein.

One difficulty in vaccine therapy has been to explain the good effects sometimes seen in the treatment of acute infections with vaccines. Wright himself and many other conscientious workers report such instances. As stated above, on the basis of the opsonic theory of Wright, this mode of treatment of acute infections was not a rational one and indeed was contraindicated. We may now believe that such favorable results were no doubt due to the nonspecific reaction caused by the bacterial protein.

At the present moment the facts would seem to indicate that the nonspecific substances referred to are able to do almost everything the specific vaccines have done in the cure of disease. In other words, the curative effects of vaccines reported heretofore may be explained by the action of the nonspecific substances in the vaccine rather than by its specific factors.

Jobling and Peterson,[1] in their analysis of the mechanism of the action of nonspecific therapy, call attention to a number of factors involved in this process. Selective stimulation of the hematopoietic tissues occurs, which results in flooding the body with antibodies which are specific, but the stimulus may be nonspecific. Hyperpyrexia and leukocytosis, emphasized especially by Gay and his associates in recovery from typhoid by this form of therapy, and the mobilization of serum protease and lipase, with an ultimate rise in the antiferment titer of the serum following injection of various foreign substances, are considered significant processes. These processes, they suggest, are dependent on certain changes resulting in the state of increased dispersion of colloids affecting both the serum proteins and the serum lipoids. Such changes are able to be brought about by a variety of substances which result in reactions clinically and therapeutically almost identical.

In such infections as the local staphylococcus infection of the skin and in some others in which, since Wright's first work, so many favorable reports have appeared it is quite possible that so far as immediate results are concerned a nonspecific foreign protein might act as well. However, in such cases there seems to be another factor concerned, namely, the specific immunity factor operating to prevent a recurrence of the infection. The nonspecific protein would probably not influence this factor and the use of autogenous organisms would be desirable for its immunizing effect. Therefore, where both a curative and preventive effect is desired, it would seem that the autogenous vaccine would be advantageous over a nonspecific protein substance, which might have only a curative action

Subcutaneous injection of foreign proteins may behave quite like the intravenous injections, though the action is slower and the dose required for the desired effect is probably somewhat larger. On account of the very severe reactions occurring at times after the intravenous method, the question may be properly raised as to its possible dangers. Evidently further data are needed here, but if a proper reaction can be elicited by subcutaneous use, this route might be preferred on account of simplicity and perhaps safety. Even subcutaneous use of large doses may not be entirely free from harm. The writer knows of a case which, following a large subcutaneous dose of dead meningococci, developed a typical reaction manifested by a severe chill in thirty minutes, followed by fever of 103, nausea, vomiting, with leukocytes on the third day numbering 45,000. On the second day the urine contained albumin and large numbers of granular and hyaline casts, which persisted for several days.

An enormous number of patients are now being treated and will be treated throughout the country by this method. Much of it will be done by inexperienced men and no doubt we may expect some serious accidents to occur. I think it behooves us to take a conservative stand in the administration of these preparations and to advise strongly against the use of all sorts of unstandardized bacterial products which are now offered and will be offered to the profession.

In case it is shown conclusively that, for therapeutic purposes, any foreign protein may serve, the logical preparation for use would seem to be a sterile pure chemical preparation of some proteose, which can be carefully standardized. Such a substance would be far more reliable and satisfactory than the various vaccine mixtures and extracts now flooding the country.

SUMMARY

Recent work tends to show that many substances, the so-called foreign proteins and their derivatives, may, when injected especially into the veins, quickly cause a severe chill followed by high fever, leukocytosis and certain changes in the blood, especially the appearance of ferments. These proteins may be derived from disease germs or they may consist of other animal substances, as serum, proteoses and milk. After the rather severe reaction, marked improvement and even permanent cure may result in certain diseases, especially typhoid, and in rheumatic and gonococcus infections. This may be due to the high fever and to increase in the ferments and leukocytes of the blood. Other factors are probably at work.

The nonspecific effect of vaccines is just now probably the most important problem that concerns the vaccinationist. The possibilities of development along this line are many, for the principle concerns an immense number of diseases, both in man and the lower animals. Questions concerning ultimate cure, recurrences, relapses and dangers cannot now be justly appreciated because of lack of data.

This form of treatment should be referred to neither as specific nor as vaccine therapy. It is nonspecific, and usually, but not necessarily, protein therapy.

The important domain of vaccines is protective, not curative, according to present data.

CLINICAL EXPERIENCE WITH THE USE OF VACCINES IN DISEASES OF THE EAR, NOSE AND THROAT *

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In the consideration of such a subject as is indicated by the title, it is evident that full justice cannot be done to each disease of the upper air passages with which immunotherapy has been tried. The option will therefore be exercised by the writer of selecting those which have been most extensively studied or are most prominently before our branch of the profession today, and endeavoring from the works of others, as well as from his own experience, to arrive at a just appreciation of their present value. He may as well confess at the start that he is a believer in this form of treatment, although admitting that it is often far from satisfactory in the light of our present knowledge. He feels somewhat diffident in presenting this subject to you and commenting favorably on the results obtained, in view of the present tendency to belittle vaccine therapy, either prophylactic or curative, specific or nonspecific.

In reality, only the threshold has been passed in the study of immunology as applied to ear, nose and throat diseases, many problems remaining to be investigated, among which might be mentioned improved methods of taking cultures and of determining the infecting organism or organisms, the preparation of more efficient vaccines, whether by sensitization or otherwise, some accurate method of counting organisms and of determining the dosage for different organisms and different individuals. And it is well to sound a note of warning at the outset, that vaccine therapy, much as may be hoped for it in the future, will probably never supersede the surgery that is necessary for drainage and for the correction of abnormalities that by their presence keep up irritation of the tissues and thus are conducive to reinfection by the same or another type of organism. Much as we should like to immunize permanently against everything, in spite of such malformations, it seems hardly probable that this Utopia will ever be reached.

In the popular craze for giving vaccine treatments which has pervaded alike the specialist and the general practitioner, vaccines have been administered for every known and unknown disease, with reason or without, more often the latter. This has been, to a large extent, due to the many commercial brands on the market and the often absurd claims put forth for them by their makers. By this it should not be inferred that these popularly called stock vaccines are without use or value, for many men have obtained results by their employment. From the very nature of the case their use is imperative in certain conditions, even the much abused mixed varieties, often miscalled polyvalent; and these vaccines must not be confused with the stock suspensions of the home laboratory, also at times a most useful product. Warning must also be issued against the confusion existing in many minds, or at least on many tongues, and this not by any means confined to the laity, between serology and vaccine therapy. It is needless to define the terms to this audience, but bacterins are so often miscalled serums that it has seemed necessary to call attention to these two distinct immunity-producing methods of treatment, since only the first will be considered here.

THE NOSE

Acute Rhinitis.—Probably the most general adaptation of vaccines to ear, nose and throat practice has been their use for the prophylaxis of acute rhinitis or common cold, not only by the specialist, but by the general practitioner, the country over. So much so, indeed, that patients now demand the so-called serum treatment. The mere fact that it has come into such general use by physicians and general demand by the laity would indicate at least some value in this method. Most of the immunization is, of course, necessarily done with the aid of commercial mixed vaccine of the many well-known different brands on the market. It would be manifestly impossible to culture the causative organisms for the next cold from every nose at present in healthy condition, although it is probable that in a certain proportion of cases organisms would be obtained from which competent vaccines could be made. In case the patient is subject to repeated acute colds, cultures taken during one of these may be used for vaccine preparation and prophylaxis against future ones, with most excellent results.

Taking it for granted then that the use of vaccines for the prophylaxis of acute rhinitis is of value, one would naturally ask of how much value this method is. Many cases, of course, will fail to respond, due probably to the fact that the organism causing the cold is not in the vaccine used whether it be autogenous or commercial mixed. For it is quite possible that in taking the culture from the nose the causative organism may not be obtained. In this relation the work of G. B. Foster,[1] recently published, in which he seems to demonstrate as an etiologic factor in acute rhinitis minute filterpassers or filterable toxins, would very readily explain these failures. By accepting this work as being of great value, we must not forget that the old, well-known organisms do cause a certain percentage of rhinitides, or at least by secondary infection prolong them to their customary length, and when due to them, vaccine treatment will prevent or cure a very considerable proportion.

The duration of immunity depends much, of course, on the amount of exposure, the individual peculiarities of the patient, the amount of vaccine given, and the presence of epidemics. For instance, a patient subject to attacks of acute rhinitis every few weeks may be so immunized that the interval will be stretched to six, eight or ten weeks or longer. The individual who has one or two bad colds during the winter may be immunized so that he will go from year's end to year's end without any. These immunized patients frequently start apparently to have colds, that is, sneezing, sniffling, coryza, etc., which symptoms pass off in the course of a few minutes or a few hours. This is readily explained if we consider the probable etiology of many colds. Change in temperature of the air inspired or impinging on certain dermal surfaces excites reaction in the vasoconstrictor and vasodilator and secretory centers and a corresponding relaxation of the nasal mucosa, an increase of blood, secretion, sneezing, etc. Here it probably is that the infection takes place and prolongs the cold. If the patient is

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Foster, G. B.: The Etiology of Common Colds, THE JOURNAL A. M. A., April 15, 1916, p. 1180.

immune to infection the cold disappears with these few symptoms.

In this connection, a word or two on the treatment of acute colds is appropriate. If colds are treated early, there is no doubt that a great many of them may be stopped short, that is, within twenty-four hours. But, of course, to do this an autogenous vaccine cannot be used, nor can a bacterial diagnosis, as a rule, be made on account of the shortness of the time. Acute tonsillitis is in precisely the same category. The well-known rôle that acute rhinitis in repeated attacks plays in diseases of the ear will at once convince the aural practitioner of the value of this prophylaxis. While the actual condition may or may not be improved by the vaccine, there can be no question that the lengthened interval between attacks and the diminished severity of them makes it possible to obtain results in the treatment of recurrent acute catarrhal otitis media and chronic catarrhal otitis media that are not possible without some such method of treatment for the nasal condition.

Accessory Sinuses.—What has been said here in relation to diseases of the ear applies equally to acute and recurrent diseases of the accessory sinuses of the nose. Vaccines, as a rule, have but little influence on suppurations of the various sinuses, except under certain conditions. When free drainage is obtained, the use of appropriate potent vaccines will usually hasten a cure. Or if given before operation, the individual's immunity will be so raised that it will accomplish the same result. But, as in diseases of the ear, perhaps their greatest value is in preventing the recurrent acute infections that so often terminate in an attack of sinusitis. The reports would indicate that the use of vaccines in cases in which the given sinuses are filled with pus with insufficient drainage is entirely useless.

Much of what has just been said is, of course, well known and to a certain extent may be considered established, although the numerous failures that everybody has have produced many pessimists in regard to vaccine therapy.

There are two new subjects to be included under the title of this paper that are of interest, besides the pollen treatment of hay-fever, which is not, of course, a vaccine treatment, although it approximates it and will, therefore, not be considered.

Ozena.—The treatment of ozena by any method has, as every one knows, been most unsatisfactory, and commissions have, at times, been appointed by various national scientific societies to study the question, but without obtaining any results. Within the last few years Hofer of Vienna, working in collaboration with Kofler, unearthed the forgotten contention of Perez that a bacillus, supposed to be of the Friedländer group and called by him the *Bacillus ozaenae-foetidae* was the cause of ozena, and could be found on and isolated from the mucosa underlying the crust. Two of the early workers in this field were Skillern and Holmes[2] of this section and their report was one of the earliest. Their findings were, as far as they went, similar to the above. Hofer and Kofler followed the lines laid down by Perez, and later Skillern, treating their patients with vaccines, not autogenous, but made by themselves from half a dozen different strains, and therefore polyvalent. Their results, while by no means uniformly good, were on the whole very encouraging, and a number of Americans in the last two years have studied with Hofer and have obtained various results by his own or modified methods. Some reports have given us total failure, others, notably Horn of San Francisco and Klenk and Guggenheim of St. Louis, claim almost universal success.

Horn, however, disproves the contention of Hofer that the *Bacillus ozaenae-foetidae*, or the coccobacillus, as he calls it, is at all related to the Friedländer group, but claims that it is a motile and flagellated organism similar to, if not identical with, that which causes distemper in dogs, the *Bacillus bronchosepticus*. He uses agglutination tests to aid in his diagnosis and administers to his patients a polyvalent stock vaccine of his own preparation and claims almost 100 per cent. of improvements or cures. Klenk and Guggenheim prepare autogenous vaccine for their patients with good results. If Horn's contention proves to be correct, that the coccobacillus is not of the Friedländer type, but belongs to the colon and typhoid group, it would seem that most investigators have been on the wrong track and have been working with the Friedländer itself, which is probably a normal inhabitant of the nose. In this connection, however, Friel[3] claims excellent results from the intravenous injection of a sensitized living vaccine of Friedländer's bacillus. He gives this in very small doses, 2 million only, and avoids severe constitutional symptoms. If the etiologic factor in ozena is not an organism of the Friedländer group, this treatment would only avail by immunizing against a secondary Friedländer infection, which might improve the patient's condition greatly. Indeed, the writer has seen some apparently good results with a killed, nonsensitized vaccine of this organism given hypodermically.

Dan McKenzie of London, a keen and usually capable observer, has just issued a claim and offered proof, that ozena is a manifestation of tubercular infection, not nasal, and believes the acid-fast bacilli which he invariably finds underlying the crusts to be attenuated forms of tubercle bacilli. His reasoning in reaching this conclusion is out of place here, but he claims very great improvement, if not cure, following tuberculin treatment, the usual small dose, without reaction, being used. While he noted marked improvement in a large percentage of cases, he found a tendency to relapse following the cessation of treatment. There was also a concomitant gain in strength and health.

Asthma.—Babcock, as well as others, has called attention to the value of autogenous vaccines in the treatment of essential asthma, and it seems not out of place to refer to it in this paper. He considers essential asthma to be an anaphylactic reaction to some form of foreign protein, whether it be animal emanations, pollen, food substances, such as fruits, vegetables, meats and shell fish, bacterial proteins from the accessory sinuses, the ears, the tonsils, pyorrheal pockets, gastro-intestinal absorption, gallbladder infection, etc. His method of combating this distressing infection is to search most industriously for the source of the protein absorption and to eradicate it, if possible, using an autogenous vaccine, in addition to the surgery, if the focus is found in the body. Besides that, or if no such focus is found, he makes an autogenous vaccine from the bronchial sputum, which can always be obtained in large quantities in these cases.

He finds the usual organisms of bronchitis or tracheitis and in addition an anaerobic organism, which he cannot classify, but which he believes to be

2. Skillern, R. H., and Holmes, E. B.: New York Med. Jour., Aug. 15, 1908.

3. Friel: Lancet, London, January, 1916.

the main cause of the asthmatic attacks, and whose inclusion in the mixed vaccine prepared seems to be necessary. By this technic he claims that most patients with essential asthma, uncomplicated by organic disease of the heart or kidneys, can be cured or at least permanently relieved. This is of the utmost importance to us who make a study of the diseases of the upper respiratory tract, and must of necessity be intimately connected with our line of work. It emphasizes perhaps as much as anything else the fact that we must not depend on vaccine alone for the treatment of our patients. The necessary surgery to secure drainage and the eradication of foci of infection is absolutely essential, and given these conditions, and an intelligent use of vaccines, great results may be anticipated. And this applies not only to asthma, but to all diseases of the ear, nose and throat.

THE EAR

There are six more or less distinct conditions of aural infection, all but one related to each other, in which vaccines have been used with some degree of success, and it is proposed to consider them in their order of severity.

Otitis Externa Diffusa et Circumscripta (Furunculosis of the External Ear).—It is well known how trying, though seemingly how trivial, this affection often is to patient and physician alike, and its well-known tendency to a succession of infections or recurrences in one or both ears or alternating between the two. It is analogous to the ordinary acne vulgaris, but it is not identical with it, and it is preeminently a very localized process and distinctly amenable to vaccine treatment. As the furuncle yields ordinarily to local treatment or is self-limiting, it is not until there is a succession of them that there is a distinct call for more definite immunization and prophylaxis against the recurring crops. Then a vaccine made from the infection evacuated by the knife will often prove most efficient in terminating the trouble. For treating the initial lesion this is manifestly impossible since by the time pus has formed in sufficient quantity for obtaining a culture that particular infection is almost at an end.

If from the history of the case it is feared that there will be more following, the wise immunologist will proceed to have a vaccine made and administer it to guard against this contingency. In case the infection is of that obstinate, painful type that shows no tendency to localize and soften, to "point," in common parlance, a stock vaccine may be utilized, since most, if not all, of these infections are caused by either the *Staphylococcus albus* or *aureus*. Left-over suspensions of these organisms, prepared for the treatment of other patients and properly preserved, frequently answer well for this purpose, or for use pending the preparation of an autogenous vaccine. If these preparations were polyvalent perhaps they would be more uniformly successful even than they are, although frequently they are most efficient. Naturally, if the infection has localized and pus is present there is a positive indication for drainage, whether vaccines are used or not. If they are a very fair prognosis for freedom from recurrence may be given.

Acute Catarrhal and Suppurative Otitis Media.—Like the preceding, acute catarrhal otitis media is a more or less self-limited affection hardly calling for the artificial production of immunity except in the treatment of the nasal condition in which it has its origin. However, if we have it in the recurrent form, cultures taken from the tympanum, or in default of this, from the nasopharynx, will produce a vaccine that will have a distinct limiting and prophylactic effect. Here again necessary drainage must be obtained either through the eustachian tube or the membrana tympani, and the contributory tonsils and adenoid removed. It must also be remembered in estimating the results in this as well as the more severe variety of the same disease, acute suppuration, that the natural tendency is to get well, almost in spite of treatment, and the mere fact that this is accomplished must not be attributed solely to the vaccine until a large number of cases has been carefully studied in detail. This has been done by Weston and Kolmer, as quoted in a previous paper, and it was shown that in a large number of cases the length of time for cessation of discharge in these suppurations was very materially reduced by the preparation and administration of autogenous vaccines.

Chronic Catarrhal Otitis Media.—So far as the writer can learn by a search of the literature, by his own experience or by the process of reasoning, vaccine therapy can have but a small direct influence on our chronic catarrhal ears. In these the damage is done, and except for the treatment of the tubal and nasopharyngeal condition, aggravated by repeated acute nasal infection, which has been discussed above, little can be expected from it. In this latter respect, however, results, albeit not brilliant, may be obtained.

Chronic Suppurative Otitis Media.—Some years ago, when it was first announced that the use of vaccines would in large part supersede the accepted methods of treatment for chronic suppurative otitis media, much doubt was expressed, and many workers took up the question to achieve, in the main, only disappointment. While not as brilliant, on the whole, as many were led to expect from one or two notable series reported, the method undoubtedly has its uses, if also its limitations, and it is the feeling of the writer that it should always be given a fair trial before proceeding to the court of last resort, namely, the radical operation, except where very distinct contraindications exist that may endanger life by delay or at least make all chance of success hopeless. Such contraindications are any symptoms pointing to the imminence of intracranial involvement, probably labyrinth suppuration, extensive caries of the tympanic walls, chronic mastoiditis and cholesteatoma.

However, even when success is not obtained by the use of vaccines in this condition and it eventually becomes necessary to proceed to the radical operation, the ground has been well prepared, a certain amount of immunity established, and the chances are that healing will be more rapid and satisfactory. The treatment of chronic suppurative otitis media by vaccines is perhaps as complicated and difficult as that of any other disease in the body. Almost always a mixed infection, it is extremely difficult to detect and isolate the causative organism or organisms, and all depends on the technic employed and the success obtained in this very first particular. The method adopted by most workers in this line is to cleanse the external canal and middle ear thoroughly by swabbing or suction, sterilize with alcohol for various lengths of time, then by inflation or suction, produce a drop of pus or moisture in the middle ear and from this take the culture with a sterile platinum loop. In this way only can contaminating saprophytes be avoided. The sterilization may be too complete, in which case no growth will result and it will be necessary to repeat the proc-

ess, but no particular harm has been done other than the delay of a few days.

With a potent vaccine made from the proper organism results will depend on the proper dosage, intervals between doses and possibly to a certain extent on the local treatment which should be carried on simultaneously with the vaccine administration, except when cases are being cared for by this method experimentally to determine its value. In these cases, no local treatment should be given. If a case is about to respond favorably to the vaccine, a local reaction is first obtained on the arm at the site of injection and a focal reaction in the ear consisting usually of a sensation of heat, an increase and a thinning of the discharge, followed after a few days by a diminution and thickening. If no improvement is observed after five or six doses have been given, or if improvement has followed up to a certain point and then ceased, the vaccine treatment is discontinued, the patient allowed to rest for a few weeks, and further cultural studies made of the ear, at which time it may be determined that the type of organism has changed and that a fresh vaccine will be made up of a new group of organisms. No one is justified when a mixed culture is obtained, as it usually is, in picking out one or two organisms and discarding the others. All organisms included when the culture has been taken in the way outlined above should be made into vaccine. By this it is meant they should be plated out and grown separately and mixed finally. Many early failures in the hands of the writer were due to arbitrarily picking out certain organisms which were thought to be causative and discarding others, notably the *Bacillus pyocyaneus*, which was not supposed to be pathogenic. It was found, on the contrary, that the *B. pyocyaneus*, when included in the mixtures or when used in pure cultures, gave probably the best results of all vaccine treatment.

It is impossible to say in what proportion of chronic suppurative otitis media the discharge can be arrested. It is not well to use the word cure because of the well-known tendency to recurrence after any method of treatment, and while it seems probable that this tendency is much less after proper immunization, still it must be recognized that it exists. In studying results also, just as in the acute diseases mentioned above, it must not be forgotten that many of these ears become dry under ordinary treatment or even without, so that due allowance for this must be made. In arriving at conclusions as to the value of vaccine in this disease, care should be used in excluding as far as possible this spontaneous result by taking only cases of proved chronicity which have been under all other methods of treatment for a long period of time.

A series of fifty cases of this type, recently reported by the writer and his assistant, M. S. Ersner, showed dry ears obtained in only 46 per cent. But in view of the fact that otherwise all of these cases would have gone to radical operation for a cure, it would seem that something has been gained. The problem here, it would seem, is to find some method of determining which organisms are the true pathogenic ones. This was attempted last year in connection with the series just mentioned and twenty-five complement fixations were done on these cases, with a negative result in all. The reasons for failure were possibly the facts that only three polyvalent collections of organisms were used as antigens or because of the extreme local character of the process in the middle ear and the constant lack of sufficient antibodies in the blood to give the reaction. Much work might be done along this line to very great profit. In this same series of cases there were no positive Wassermann reactions among the failures, but there were five positive von Pirquet tests.

Mastoiditis and Its Complications.—No one will advocate dependence on vaccines for the treatment of a case of acute mastoiditis if this is avoidable, though it is conceivable that they may be used if for some reason operation is out of the question or might bring added danger. There would be no objection to their use during the period before operation of a slowly developing mastoiditis. They would at least do no harm and would probably raise the patient's resisting power sufficiently to make quick recovery possible. They must, however, in no sense be considered to take the place of the mastoid operation in case this is possible and imperative, but several times in the practice of the writer, and many times by personal reports to him from other practitioners, the administration of vaccines has put a definite check to a slowly progressive mastoiditis or has been the determining factor toward resolution in one that was at a standstill.

While definite failures to produce this result have also been reported, it is the opinion of many that it is often a useful procedure. That it is dangerous teaching is evident, as it may hold out hope for recovery until the time of election for operation is past, and vaccine should therefore be used with the greatest care and judgment in mastoiditis and the indications for operation closely watched. At the time of operation, pus recovered from the mastoid should always be sent to the laboratory for bacterial diagnosis, and it is the writer's custom either to have a vaccine made at once or at least to keep subcultures going until it is determined that a vaccine will not be needed. The first method is preferable, as it is very little more troublesome and the vaccine is ready for use if the case does not progress satisfactorily. Indeed, it would seem wise to use the vaccines in all cases as soon as prepared after operation, since healing is more prompt by their use. When we come to intracranial complications and general septicemia, vaccines are of no avail. In this acute general process antitoxins and serums should be the more scientifically correct, but evidently do not seem to have been of very much use in practice.

STOCK VACCINES

The writer has an open mind as to the relative values of autogenous and stock vaccine. That the latter is often of value in cases in which the autogenous product has failed is beyond question from any one who has done much of this work. Indeed, the whole theory of prophylactic immunization depends on this fact, so well exemplified in the case of typhoid fever. So far as it has gone, also, the vaccine treatment of ozena by a polyvalent stock vaccine has proved eminently satisfactory in the hands of Horn. It can readily be seen how this may be so, if the suggestion of a basic protein common to all bacteria, or at least to associated groups, be accepted, giving at least partial immunity, and it is equally evident that it may fail in certain instances, notably the streptococcus group, since there are so many different varieties with widely separated characteristics and of greatly differing degrees of toxicity.

The subject of bacterial therapy is an absorbing one to most practitioners, and since commercial vaccines

have been supplied in such quantities and made so readily obtainable, it has been used by thousands who doubtless understand little of the therapeutic action of the agent being used. Frequent warnings have been issued against the indiscriminate use of vaccines and the dangers attendant on their employment. The question is often asked whether under the circumstances a nonbacteriologist is justified in their use and if the danger is not greater than the chance of cure. The writer, while he formerly inclined toward this view, after having given several thousand injections in clinic and in private practice and being cognizant of as many more, has yet to see any more harm result from their use, even if not always intelligent, than from an equal number of ordinary hypodermic injections. One or two cases have been reported to him with somewhat severe reactions, alarming at the time, but this may happen with almost any form of therapy. Of course the claims of the makers of commercial vaccines are usually absurd and misleading, although it is surprising how many men of intelligence will accept them at times, even in the face of all reason.

SUMMARY

To summarize briefly, the writer feels that if vaccines have not fulfilled all of their early promise, they have at least given us a very effective extra means of combating infection, especially if used in conjunction with skilful and intelligent surgery, and that little harm will or can result from their use, even by the novice, provided the injections are given hypodermically, rather than intravenously, as in the latter method the reactions are at times exceedingly severe and alarming. In a number of instances, notably ozena, it seems as if vaccine therapy alone might solve a problem which has been puzzling clinicians hopelessly for years, and until some more efficient substitute is discovered, vaccine therapy has its distinct place as a therapeutic measure in diseases of the ear, nose and throat.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. DAVIS AND COATES

DR. DANIEL W. LAYMAN, Indianapolis: I have had some experience in the use of autogenous vaccines in the treatment of cases of chronic suppuration of the accessory sinuses. As far back as 1912-1913 I used the autogenous vaccine in the first group along with the regular routine treatment. In almost all of these cases we established thorough drainage by operative procedure, whether it was a conservative or radical case, and after the effects of the operation subsided we commenced this series of cases with autogenous vaccines, made both in the regular way and by animal experimentation. Most of these cases were of the staphylococcus type, *Staphylococcus aureus* predominating. In the second group we used the autogenous vaccine without the necessary operative procedure. These patients refused nasal surgery and so I carried them along as well as I could with only the vaccine. Then in the third group of cases, just for comparison, I used the regular method of treatment without any vaccine whatsoever. I think that my results were about the same as Dr. Coates reports; that is, that the vaccine is a material aid in the treatment of chronic suppurative disease of the accessory sinuses along with the routine treatment and necessary nasal surgery. In other words, it is absolutely necessary to establish thorough drainage and ventilation, and vaccine therapy per se, that is, without the assistance of other treatment, failed to be of any benefit as a therapeutic agent.

In the third group I used routine treatment and operative procedures when necessary, but without the aid of vaccines. Compared with the first group they did not do as well. In other words, I found that autogenous vaccine is a valuable aid in the treatment of chronic suppurative conditions of the sinuses where the treatment has been given to establish proper drainage and aeration of the sinuses. In regard to the treatment of acute rhinitis, I have not had any experience with autogenous vaccines, but I have had some experience with the stock vaccines. Two or three men who worked in a drug house came to me with bad colds in the head. They brought with them some stock vaccines and wanted me to try them out. I did so and got fairly good results. I did not use the stock vaccines during the acute attack, but waited until the acute attack was over and then gave the vaccine at three or four day intervals, about three or four doses altogether, increasing the strength from time to time. The treatment with stock vaccines of ordinary colds not only with the clerks as above mentioned, but with other patients, has been quite satisfactory.

DR. JOHN A. PRATT, Aurora, Ill.: I have been lucky in my vaccine cases. I have had very good results. I use both the autogenous and the stock vaccines. In cases in which I do not have the time to make the autogenous vaccine, I have taken the autogenous vaccine of other cases and mixed it with the stock vaccine and injected that. In that way I thought I should be able to obtain a vaccine of the local germ, of a local infection that was going round, and these patients have seemed to improve. Patients with sinus trouble have improved rapidly in my hands with vaccines. It does not seem to make much difference whether it is autogenous or stock. One case of tuberculous middle ear discharge ran a long time. The patient, a woman, did not improve under the autogenous vaccine, and at that time an old gentleman came in who had a running ear for years, so I decided to try this woman's autogenous vaccine on the old man. I gave him three injections and the ear dried up and was cured. That was about five years ago. He was in my office before I came away and I asked him about his ear and looked at it, and it was perfectly dry. In the woman I had no improvement whatever. This possibly may be, as Dr. Davis indicates, leukocytosis, but I have seemingly had some results from the vaccines.

DR. DAVID JOHN DAVIS, Chicago: Many phases of this problem are unsatisfactory to discuss at the present time. We need more data and especially do we need control observations. It is remarkable how few control data exist in vaccine work. There is no doubt that reactions occur after vaccines and that good results have followed their use in some cases but the question centers around the idea of specificity. In other words, have these reactions a specific curative value? At present, data are rapidly accumulating indicating the nonspecific character of the results. It is an interesting fact that so far as animal diseases are concerned we do not know of any instance in which vaccines are curative. This is in striking contrast to the rôle that vaccines play in animal diseases for prophylactic purposes. This is true of natural and experimental animal diseases. For example, Dr. J. J. Moore has shown that in rabbits already infected with streptococci, vaccines have no appreciable effect on the course of the infection. However, if the vaccines have been given some time previous to the inoculation the animal may be protected to some degree at least.

DR. GEORGE M. COATES, Philadelphia: Laboratory men and clinicians are very apt to differ, and it seems to me very necessary that they should get together more closely than they have in the past. Animal experiments prove a great deal from their standpoint, but it is only by using the results of these in combination with the work of the clinicians that we get ideas about the value of our methods of treatment. In regard to specificity, I always supposed that if we did not get results with the autogenous vaccines it was due to the fact that we did not have the specific organism. If this new theory is to be accepted it wipes that out—the stock vaccines will probably give as good results as the specific vaccines. We are at the beginning of this method of therapy, after all.

An Estimate.—But nothing is more estimable than a physician who, having studied nature from his youth, knows the properties of the human body, the diseases which assail it, the remedies which will benefit it, exercises his art with caution and pays equal attention to the rich and the poor.—Voltaire.

STUDIES OF THE GASTRIC RESIDUUM

I. A STUDY OF EIGHTY SAMPLES OF GASTRIC RESIDUUMS OBTAINED FROM APPARENTLY NORMAL WOMEN *

CHESTER C. FOWLER, PH.D.
AND
ZELMA ZENTMIRE, M.S.
AMES, IOWA

Extensive studies of the gastric residuum of normal men have been made by Hawk and collaborators.[1] These investigations have demonstrated that the average volume is quite large (in over 100 normal cases the average was 52.14 c.c.), quite contrary to the views of Loeper,[2] Zweig,[3] Kemp,[4] Wolff,[5] Strauss,[6] Riegel,[6] and Soupalt,[6] who assert that the quantity of residuum in the normal fasting stomach should not exceed 20 c.c. Rosin and Schreiber[6] suggest a maximum limit of 60 c.c. for the volume of the gastric residuum. A variation of from 17 to 180 c.c. in the volumes of the various residuums examined by Hawk further demonstrates the unimportance of the quantity of residuum as an aid in diagnosis. These findings of Hawk and collaborators have recently been confirmed by Talbot.[7]

The residuum is a physiologically active secretion[8] and is probably in part the result of the activity of the gastric glands[8] and in part the result of fluid which passes by osmosis[8] through the stomach walls into the lumen of the stomach. The fact that bile and trypsin are both quite frequently found in the residuum leads one to believe that a portion of it at least is due to regurgitation of fluid from the duodenum.[9] Swallowed saliva and esophageal secretions may also give rise to another portion.[10] The last factor was greatly eliminated in the work of Hawk and collaborators[1] by encouraging the subjects to reject as much saliva as possible by expectoration. That the residuum is not wholly due to saliva was clearly demonstrated by Fowler, Rehfuss and Hawk, in the case of Subject B 106 a. This subject, normal in every way, submitted to the passage of the tube on the empty stomach in the morning. Forty-nine c.c. of liquid were removed, and tests showed that the stomach was empty. Two hours later, during which time the person in question attended a lecture, was free from psychic stimuli, and swallowed no saliva, 29 c.c. were withdrawn (Case B 106 b). Furthermore, these two secretions were essentially the same in every particular. Carlson[11] has also demonstrated that a fluid is being continuously secreted into the empty stomach.

The total and free acidities are subject to almost as wide variations as is the volume. The total acidity, in the cases presented by Hawk, ranged from a minimum of 2.4 c.c. of tenth-normal sodium hydroxid to titrate 100 c.c. of juice (about 0.009 per cent. acidity in terms of hydrochloric acid) to a maximum of 77.6 c.c. (about 0.28 per cent. hydrochloric acid), with a mean average of 29.9 c.c. (about 0.11 per cent. hydrochloric acid). The free acidity averaged 18.5 c.c. (about 0.07 per cent. hydrochloric acid), with a range from 0 c.c. (0 per cent. hydrochloric acid) to 65.8 c.c. (about 0.24 per cent. hydrochloric acid). These acidities are much smaller than those given by Carlson,[12] and obtained from a subject with a gastric fistula. The acidities of the contents of the empty stomach of this subject were 0.23 per cent. hydrochloric acid and 0.18 per cent. hydrochloric acid for total and free, respectively.

A definite relation between the pepsin content of the gastric residuum and total acidity has been demonstrated for low acid values, but this relation has been shown to disappear as high acid values are approached (Fowler, Rehfuss and Hawk).[1]

The same investigators found trypsin to be present in practically every specimen of residuum which was examined for it. Dorner[13] showed the presence of trypsin in practically all of the residuums obtained from 154 patients, most of whom had gastro-intestinal disturbances. The cases reported by Hawk and co-workers[1] were nonpathologic. The occurrence of trypsin in the stomach has been more completely studied by Spencer, Meyer, Rehfuss and Hawk.[9]

The present investigation was undertaken for the purpose of determining whether or not there existed any pronounced differences between the residuums of normal men, and the residuums of normal women.

METHODS

The subjects of the experiments described in this paper were young women students in the courses in physiologic chemistry at Iowa State College. They willingly submitted themselves for the experimental work, and were requested to drink no water at any time after their evening meal on the night previous to the experiment. They came for the removal of the residuum at 8 o'clock the following morning, and every residuum was removed as near that time as was compatible with the experiment. Each woman was given a thorough examination, physically and by questioning, to detect any abnormalities if they existed.

The residuums were removed by means of a modified stomach tube described by Rehfuss.[14] The swallowing of the tube was accomplished without the aid of water. The tube and tip were first coated with a thin film of petrolatum, and then the tip was placed in the lower part of the pharynx, back of the tongue, and swallowed without much difficulty. When the tube had reached the stomach (which was ascertained by measurements), the contents were aspirated from it while the subject was reclining on her back, stomach and on each side and breathing deeply. The liquid was immediately measured, placed in an Erlenmeyer flask, and its characteristics noted. The residuum

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* Because of lack of space, this article is abbreviated in THE JOURNAL by omission of a table of tests of the normal gastric residuum of women. The complete article appears in the reprints, a copy of which will be sent by the authors on request.

1. Rehfuss, M. E.; Bergeim, Olaf, and Hawk, P. B.: Gastro-Intestinal Studies, I, The Question of the Residuum Found in the Empty Stomach, THE JOURNAL A. M. A., July 4, 1914, p. 11. Fowler, C. C.; Rehfuss, M. E., and Hawk, P. B.: Gastro-Intestinal Studies, X, An Investigation of the Gastric Residuum in Over One Hundred Normal Cases, Sept. 18, 1915, p. 1021.
2. Loeper: Leçons de pathologie digestive, Series 2, 1912, pp. 17-19.
3. Zweig: Magen und Darmkrankheiten, p. 459.
4. Kemp: Diseases of the Stomach, Intestine and Pancreas, 1912, p. 133.
5. Wolff: Taschenbuch der Magen und Darmkrankheiten, p. 22.
6. Cited by Loeper (Footnote 2).
7. Talbot, E. S., Jr.: The Examination of Normal Gastric Secretion by the Fractional Method, THE JOURNAL A. M. A., June 10, 1916, p. 1849.
8. Fowler, Rehfuss and Hawk (Footnote 1).
9. Fowler, Rehfuss and Hawk (Footnote 1). Spencer, Meyer, Rehfuss and Hawk: Am. Jour. Physiol., 1916, **39**, 459. Boldyreff: Quart. Jour. Exper. Med., 1914, **8**, 1.
10. Sokolow: Dissertation, St. Petersburg, 1904 (Babkin: Die Aeussere Sekretion der Verdauungsdrusen, 1914, p. 110). Grobbel: Ztschr. f. physiol. Chem., 1914, **89**, 1.
11. Carlson: Am. Jour. Physiol., 1913, **31**, 151.
12. Carlson: Am. Jour. Physiol., 1915, **38**, 248.
13. Dorner: Deutsch. Arch. f. klin. Med., 1915, **117**, 540.
14. Rehfuss: Am. Jour. Med. Sc., June, 1914.

was then filtered through moistened qualitative filter papers, and the first few drops of filtrate were discarded. The following determinations were then made, as far as possible, on the filtered residuum: total acidity, free acidity, pepsin and trypsin.

The methods[15] for total acid, free acid and pepsin were those used by Rehfuss, Bergeim and Hawk.[16] Trypsin was determined by the method of Spencer.[17]

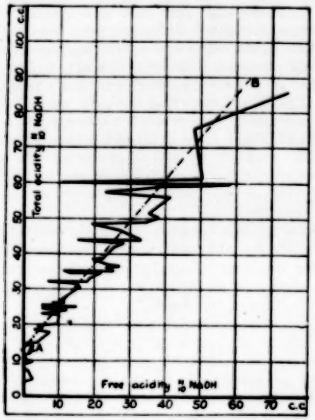

Chart 1.—Relation of total to free acidity of residuums.

DATA

Eighty-one samples of residuums were collected from sixty different subjects; twenty-one of the subjects submitted to the passage of the tube twice.

Averages on the Compilation of the Normal Gastric Residuum.—1. The average quantity removed in eighty-one cases was 49.44 c.c., the largest quantity being 135 c.c. and the smallest 12 c.c.

2. In sixty-nine cases noted, the residuum was in twenty-two cases (32 per cent.) colorless, and in forty-seven cases (68.1 per cent.) yellow or green.

3. The total acidity recorded in eighty-one instances averaged 30.3 in terms of tenth-normal sodium hydroxid, with the highest figure at 86.0 and the lowest at 4.0.

4. The free acid (seventy-nine cases) averaged 15.6, with figures ranging from 74.5 to 0.

5. The pepsin concentration as measured by the Mette method was determined in seventy-nine cases, and gave an average[18] of $(3.3)^2$, highest $(6.7)^2$ and lowest $(0.0)^2$.

6. Trypsin was tested for in sixty-three cases, with an average of 5.2 units; ten cases gave 16 units, and fifteen no reaction. Thus in 23.8 per cent. of the cases there was no evidence of trypsin.

7. Microscopic examination revealed on no occasion gross food residues. On several occasions vegetable débris was found, but never meat fibers. Leukocytes, in considerable number, were found almost constantly, and occasionally swallowed material from the throat with bacteria.

COMMENT

In eighty-one cases the average volume of the gastric residuum of normal women was 49.44 c.c. This quantity is greatly in excess of the generally accepted limit of 20 c.c., and very close to the average value of 52.14 c.c. obtained from over 100 cases of normal men.[8] The range of volumes was likewise extremely wide (from 12 to 135 c.c.), similar to the range of from 23 to 160 c.c. obtained by Fowler, Rehfuss and Hawk.[1] Hence in regard to volume there appears to be little or no variation in the residuums of normal men and normal women. The volumes of the residuums obtained from women were only slightly lower than those obtained from men.

Decided variations in the color of the residuums of normal women were observed (similar to variations observed in the case of men);[8] 31.9 per cent. of the observed cases were colorless, while 68.1 per cent. were colored. This shows a slightly lower percentage of colorless samples and a slightly higher percentage of colored samples in the case of women than in the case of men (men 43 per cent. colorless, 56 per cent. colored).[8] Both colorless and bile colored residuums were obtained from the same individual at different times, and even were occasionally obtained during the course of a single aspiration. This was especially noticeable after the subject had rolled from one side to the other. The color is apparently controlled by the flow of bile through the pylorus into the stomach, rather than as Sartory[19] has suggested by the growth of a chromogenic yeast (*Cryptococcus salmoneus*). This point is being made the subject of an extended experiment in this laboratory and will be reported on in a later paper.[20]

The color is more often seen in cases of high acidity. Of the forty-seven colored cases reported, about 85 per cent. appear in acidities over 30, while only 15 per cent. appear in acidities of less than 30. This would appear further to support Boldyreff's[9] idea of duodenal regurgitation to regulate gastric acidity.

The relation of total acidity to free acidity is shown by Chart 1. As in the instance of the previously cited cases of men, free acidity is rarely encountered until the total acidity exceeds 10. In total acidities of over 14 there were no cases in which free acidity was not demonstrable (over 13.5 found by Fowler, Rehfuss and Hawk[1] for men). The greater number of the residuums lie between total acidities of 20 and 60

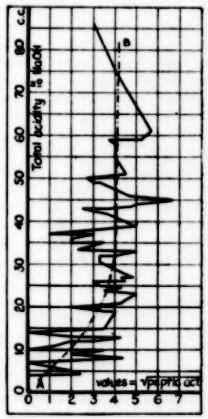

Chart 2.—Relation of pepsin content to total acidity of the residuums.

15. Hawk: Practical Physiological Chemistry, Ed. 5, pp. 162, 165, 166.
16. Rehfuss, M. E.; Bergeim, Olaf, and Hawk, P. B.: Gastro-Intestinal Studies, II, The Fractional Study of Gastric Digestion, with a Description of Normal and Pathologic Curves, The Journal A. M. A., Sept. 12, 1914, p. 909.
17. Spencer: Jour. Biol. Chem., May, 1915.
18. In this paragraph, the superior 2 (²) indicates the square of the preceding quantity.
19. Sartory: Bull. Soc. de biol., 1906.
20. Fowler, Levine and More: Unpublished data.

(from 25 to 52 for men).[6] A few lie above 60, and considerably more below 20. The average total acidity was 30.3, and the average free acidity was 15.6 (the average acidities in the case of men were: total, 29.9; free, 18.5).[6] The range in total acidity for women was found to lie somewhat higher (from 86.0 to 4.0) than it was found to lie for men (from 77.6 to 2.4),[6]

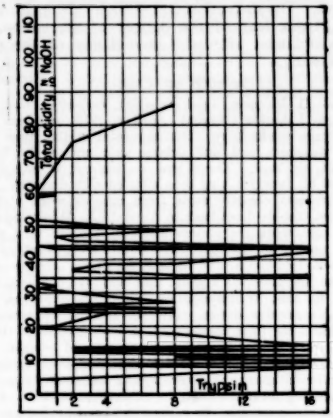

Chart 3.—Relation of trypsin to total acidity of residuums.

and the same was true for free acidity, women, (from 74.5 to 0); men, (from 65.8 to 0).[6] Only two cases were above 70 in total acidity.

In regard to acidities, and also volumes, it is worth mentioning that we have noticed at various times during our investigation a remarkable constancy in the volume and total acidity of residuums from the same person collected at widely different times. This point is worth further investigation.

Pepsin was tested for in every case studied but two, and was found in all cases tested, except three of low acidity. The average value[18] of peptic activity was $(3.3)^2$, somewhat higher than the value of $(2.8)^2$ obtained for men.[6] The highest value was $(6.7)^2$, compared to $(5.0)^2$ for men,[6] and the lowest were $(0.0)^2$, men[6] $(0.7)^2$.

In the case of women the same relationship between the quantity of pepsin and total acidity for low acid values is seen (Chart 2) as was observed in the case of men.[6] This view is contrary to that of Pawlow,[21] who asserts that no such relation exists. This relationship is likewise seen to disappear as high acid values are reached, more or less supporting the view of Gregersen[22] who states that the relation of pepsin to hydrochloric acid is not an absolute one. In none of our cases were we able to demonstrate the presence of pepsin in the absence of total acidity. Aliprandi[23] asserts that pepsin may occur in the absence of hydrochloric acid, and also that there is no strict parallelism between pepsin and hydrochloric acid.

The trypsin content of the gastric residuum of women was determined in sixty-three cases. Our results do not bear the striking similarity to the trypsin content of the gastric residuum of men[6] (only twenty-six cases determined) that the volumes, total acidities, free acidities and pepins do. Charts 3 and 4 show the relation of trypsin to total and free acidity, respectively. From these charts the relation of trypsin to free acidity is not as evident as it was in the work on men.[6] Furthermore, several cases of low acidity were obtained in which there was no trypsin or only a little, while one case, the acidity of which was over 70, presented a trypsin content of 8. In the case of men,[6] a content of trypsin equivalent to 16 was not found above a free acidity of 20; several were found between 20 and 30 in the case of women. Of the sixty-three cases examined, fifteen, or 23.8 per cent., contained no trypsin as compared to 7.7 per cent. in the case of men.[6] An average value of 5.2 units was obtained for trypsin in the cases of women, as compared to 9.1 units for men.[6] This and the previously mentioned differences may constitute a fundamental difference between the residuums of men and women; but we are inclined, for the present at least, to consider these differences to be due mainly to the smaller numbers of cases examined in the work of Fowler, Rehfuss and Hawk.[1] This can be settled only by a more extensive investigation.

21. Pawlow: The Work of the Digestive Glands.
22. Gregersen: Arch. f. Verdauungskr., **19**, 263.
23. Aliprandi: Lavor. riv. chem. micros. clin., **1**, 230.

SUMMARY

1. No striking differences between the gastric residuums of normal women and of normal men have become evident during the course of this investigation.

2. The accepted limit of 20 c.c. for the volume of the residuum of the empty stomach of normal women is too low. An average volume of 49.44 c.c. was obtained in eighty-one cases.

3. Both colorless and bile-colored residuums may be found. The two may occur in the same individual on different days or during the same aspiration.

4. The colored residuums are found more frequently in higher acidities. This is explained, as before, by the greater frequency of regurgitation in higher acidities.

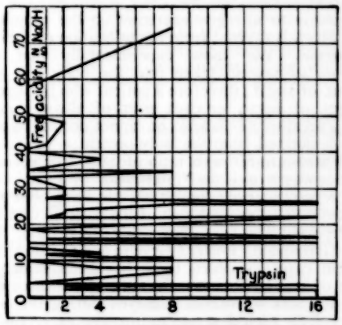

Chart 4.—Relation of trypsin to free acidity of residuums.

5. Total and free acidity vary directly with each other, free acidity rarely being found with a total acidity of less than 10, and always being found when the total acidity was greater than 14.

6. Two cases were observed in which the total acidity was greater than 70. In general, the total and free acidities of the residuums of the women subjects

observed run higher than those of the men subjects reported by Fowler, Rehfuss and Hawk.[1]

7. The definite relation of pepsin to acid in low acid concentrations has been confirmed. Also, this relation is seen to disappear as high acid values are approached.

8. The trypsin content of the gastric residuums obtained from women was shown not to bear the striking inverse relation to the free acidity that was demonstrated to be true in the case of residuums obtained from men.[8] This is thought to be due to the larger number of samples examined in the present investigation, and not to be due to any fundamental difference in the residuums of men and of women.

ABSOLUTE DIABETES WITH RETURN OF FUNCTION

REPORT OF A CASE *

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By an absolute diabetes is meant one in which the patient so afflicted is not able to utilize any carbohydrate which is taken in the food or any of the sugar which is yielded from protein metabolism. There is no very good evidence that fat is converted to sugar in the diabetic. All diabetics of the severity of this case, it is reasonable to assume, have no deposits of glycogen in their tissues. The only two sources for sugar, then, would be that which was fed to the patient and that derived from the breaking down of the protein molecule. Each 6.25 gm. of protein which is utilized in the body is represented by 1 gm. of nitrogen excretion. Practically all nitrogen is eliminated through the kidneys. Since fats are not converted to sugar, and since there are no glycogen deposits in the tissues, it is readily apparent that any sugar which is excreted in the urine of a starving diabetic must come from the protein. If the total nitrogen output and the total sugar output are determined for twenty-four hours and the former divided into the latter, it will give the ratio of dextrose to nitrogen excretion or the amount of sugar which is derived from the utilization of 6.25 gm. of protein. We know experimentally that each 6.25 gm. of protein taken into the body will yield 3.65 gm. of sugar; therefore a patient who is excreting 3.65 gm. of sugar for each gram of nitrogen in the urine is an absolute diabetic, or cannot utilize the sugar which is derived from the body protein.

A dextrose to nitrogen ratio of 3.65:1 occurring in diabetics was termed the "fatal ratio" by Lusk.[1] Certainly a better terminology could not have been given the condition. Practically all of the patients who have been reported who have shown this "fatal ratio," have died. Greenwald,[2] Foster,[3] Geyelin and Du Bois[4] have reported cases in which there has been subsequent return of sugar tolerance. In none of the three cases just cited was starvation employed during the entire course of the high dextrose to nitrogen excretion. In the case I am describing, starvation was practically continuously adhered to from the time it was started, until the patient became sugar free. I feel confident starvation was the factor which shortened the course of the "fatal ratio" period in this case, and without its aid our patient would doubtless have succumbed to his severe diabetes combined with the infection which he had with acidosis. After a brief critical period of four days, the patient was free from all severe diabetic symptoms. The starvation was not a hardship for him. Besides, from fear of the danger of starvation, he never complained after the second day of the prolonged fasting.

REPORT OF CASE

History.—D. M., man, aged 26, white, carpenter, was first admitted to Lakeside Hospital, April 8, 1915, and was discharged three weeks later. His complaint at that time was extreme weakness and dull aching pain across the lower portion of his back. There was no history of any other member of his family having been afflicted with diabetes. The past history was negative aside from measles when a child. The present trouble dates back to April, 1913. While engaged in some light work the patient suddenly became very weak and was unable to continue. He immediately went to see a doctor who told him he had sugar in the urine. He remained away from his work for a short time and was cautious with the food he ate; he immediately felt much improved and resumed his regular duties. For six months he remained comfortable. He then commenced to have excessive thirst, increased urine output, persisting weakness and gradual loss in weight. Since that time his condition had been variable; some days he felt good and other days he was totally incapacitated, depending on how closely he adhered to his diet. During the last three months, the patient had been having numerous boils and pains in his back and legs.

Physical Examination.—The patient impresses one as not possessing average mentality; he talks at random and asks countless questions during the day. He is a well developed man but extremely poorly nourished. His weight prior to the onset of this trouble was 156 pounds; he now weighs 125 pounds. He is extremely weak and prefers to lie on the bed. His actions and movements are those of a senile man. There is a very marked sweetish odor to the patient. Skin and mucous membranes are dry and parched. There is a bright scarlet hue to the skin about the face and neck; he looks as if he were sunburned, but has not been exposed to the sun. Nothing abnormal was observed from an examination of the eyes and eye grounds or the nose and ears. The teeth are in moderately good condition, but there is a marked pyorrhea alveolaris. The tonsils are small and show no signs of infection. Heart, lungs and abdomen are normal. Reflexes are slow and sluggish in response, but there are no other abnormal findings from the neurologic examination.

The Wassermann reaction is negative on blood and spinal fluid.

Urine examination shows 97 gm. of sugar in the twenty-four hours. The acetone and diacetic reactions are very distinct.

During the patient's stay of three weeks in the hospital it was not possible to get his sugar output below 45 gm. in the twenty-four hours by strict dieting. He was feeling much better, however, and insisted on going home, so he was discharged.

During the time from his first admission to the last one with which we are interested, nothing more was heard of the patient until he presented himself to our dispensary, Jan. 14, 1916. He was promptly admitted to the hospital.

Record of Last Admission.—D. M. was admitted to the medical service for the second time, Jan. 14, 1916. His complaint at this time was a severe cold and a boil on the back of his neck, both of which developed about one week before. Since his discharge from the hospital, April 21, 1915, his condition had been variable; a part of the time he was able to work. He volunteered the information that his diabetes was better and his only trouble was the cold and boil.

* From the Department of Medicine and the Laboratory for Medical Research of Lakeside Hospital and Western Reserve University School of Medicine.

1. Mandel, A. R., and Lusk, Graham: Diabetes Mellitus, The Journal A. M. A., July 23, 1904, p. 241.
2. Greenwald: Jour. Biol. Chem., 1913, **16**, 393.
3. Foster: Deutsch. Arch. f. klin. Med., 1913, **110**, 501.
4. Geyelin, H. R., and Du Bois, F.: A Case of Diabetes of Maximum Severity with Marked Improvement, The Journal A. M. A., May 13, 1916, p. 1532.

The most striking things about the patient which had not been so noticeable at the previous examination were a greater degree of emaciation, and an appearance of being extremely sick. In addition to the findings of the former examination there was a carbuncle about 4 cm. in diameter on the left side of the patient's neck. It had the usual multiple openings, and there was a slight amount of purulent discharge. It was extremely red and swollen, with pronounced induration; there was only a moderate amount of pain in connection with it. The patient had a slight elevation in the pitch of the percussion note, with higher pitched breath sounds over the upper right posterior portion of the lung. No râles. Aside from these noted facts there was nothing made out in addition to that described in the previous physical examination.

Jan. 15, 1916, the patient was started on a test diet in the morning. This diet consisted of 16 gm. of nitrogen and 50 gm. of carbohydrate. Twenty-four hour urine started at 7 a. m. There was a distinct "acetone odor" to the patient's breath. His respiratory rate was 25 to the minute, but he was wide awake and did not appear to be in any immediate danger of coma.

January 16, the patient was still on the test diet, and was eating every particle of food served him. There was a daily elevation of temperature to 101 F. His condition was apparently worse than the day before, but there was nothing evident to explain why it should be.

January 17 the patient was started on starvation. He was being given 180 c.c. of whisky daily, black coffee as desired, and 30 grains of sodium bicarbonate every four hours by mouth. The general condition was much the same as the day before.

January 18, starvation was continued. The patient was considerably worse. The tension of carbon dioxid in the alveolar air had dropped to an alarming figure. The respiratory rate was averaging around 25. He was more drowsy than he had previously been, and he was taking very little interest in things about him. We considered the advisability of terminating the fast and giving sodium bicarbonate intravenously.

January 19, starvation was continued. The patient seemed better; there was a slight increase of the carbon dioxid tension.

January 20, on account of the demands of his friends, he was given a small amount of food. He was much better; he seemed much wider awake and said he felt better. The whole carbuncle area had sloughed out, leaving the muscles of the neck exposed. The area now measured about 6 cm. in diameter. Nothing was being done for it except hot dressings at frequent intervals and keeping the area clean.

January 21, the same amount of food was given the patient as the day before. He was much better, but the sugar in the urine had apparently struck a constant level and would not diminish. The small amount of carbohydrate had apparently lowered the dextrose to nitrogen ration. However, it is a question in my own mind whether the 10 gm. of carbohydrate which the patient received was absorbed in his blood stream as dextrose. It was given in the form of greens, and they appeared in the stool unchanged. Had they not been utilized, the dextrose to nitrogen ratio would have been 2.6:1 on these two days instead of the figure given in the table.

January 22 the patient was again started on starvation. He was improving rapidly so far as his general appearance was concerned. The tension of carbon dioxid was gradually coming up.

January 24 starvation was continued, as it had been the day before. General condition was much better. The patient complained very little because food was not given him.

January 25 starvation was continued. It will be noted that there was a sudden drop in the protein metabolism the day before as indicated by the nitrogen output. Although the dextrose to nitrogen ratio continued nearly the same, the diminution of protein metabolism was looked on as a good omen.

January 26 the patient was much improved. The sugar output and dextrose to nitrogen ratio had dropped very decidedly. Starvation was continued. There was a sudden rise in the dextrose to nitrogen ratio of the preceding day. This perhaps was due to the fact that the patient ate a small amount of oatmeal which he took from another patient's tray. It was dry oatmeal without cream or sugar, and attendants on the ward thought he obtained a very small amount.

January 27 starvation was continued. The sugar output and dextrose to nitrogen ratio had both come down very decidedly.

January 28 the patient had but a trace of sugar in the urine in the morning, and it was decided to start food immediately. He was given 10 gm. of carbohydrate in the form of 5 per cent. vegetables and 25 gm. of fat. This amount was divided into six feedings for the day. The patient was decidedly improved. The alveolar carbon dioxid tension was back to approximately a normal figure. The area on the patient's neck was much improved; granulation tissue was beginning to form with great rapidity, and there was very little discharge.

January 29, the patient's urine became sugar free. His food was increased to 20 gm. of carbohydrate and 50 gm. of fat.

February 1 the urine remained sugar free; the patient was taking 30 gm. of carbohydrate. Total food intake was 1,440 calories; of that amount about 500 calories were derived from whisky.

February 8, the urine remained sugar free. The patient was taking about 1,950 calories daily.

February 16, the patient's condition continued to improve. There had been only a trace of sugar in the urine on two occasions. There was an acetone reaction still persisting in the urine. The patient was now taking 45 gm. of carbohydrate daily, or a total intake of 2,390 calories. There was some slight discharge from the neck, but granulations had largely closed in the area.

February 25 there was sugar in the urine on two successive days; his tolerance was exceeded. He was given a starvation day, which promptly eliminated the sugar from the urine. He was now taking 2,500 calories daily.

February 28 he had remained sugar free since the instance just recorded. He had been having a daily rise of fever since the day of admission. It had varied, usually never exceeding 101 F. Today was the first day he was free of fever. The physical signs had not varied in the lungs. We were fearful of a tuberculosis and that the prolonged starvation and undernourishment might revive it. If that were the case, however, we were not able to demonstrate any alteration in the lung condition.

March 5, 1916: The patient had been free of fever since February 27. There had been a trace of sugar in the urine on a couple of days since February 25. The area on the neck was covered by a small scab; there was no discharge. The physical signs in the chest were just the same as they were on admission. He was now taking: carbohydrate, 60 gm.; protein, 55 gm., and fat, 225 gm., or a total intake of 2,500 calories. The patient was quite comfortable and wanted to go home; consequently he was discharged and referred back to our dispensary.

Methods of Study.—For the total nitrogen determinations the Kjeldahl method was employed. Ammonia estimations were made by the simple titration method, potassium oxalate, formaldehyd and tenth normal sodium hydroxid being used. These results were occasionally checked by the Folin aeration method. Sugar was determined in the blood and urine by the methods of Benedict. The carbon dioxid tension in the alveolar air were practically all made with the Fridericia instrument, but an occasional determination was made with the Haldane apparatus. Acetone and aceto-acetic acid were estimated together by the method of Folin and Hart.

COMMENT

1. The condition of absolute diabetes has been one of considerable interest since the pioneer work on the subject was recorded by Minkowski.[5] This observer discovered that when the pancreas was completely removed from a dog, whether the animal was fasted, fed with a diet of protein or on protein and fat that it would excrete 2.8 gm. of sugar in the urine for each gram of nitrogen. As the animal was glycogen free,

5. Minkowski: Arch. f. Exper. Path. u. Pharmakol., 1893, **31**, 85.

and fat in no way affected the ratio, Minkowski concluded the sugar could come only from the protein. Other experimenters did not agree with the results of Minkowski at that time, as they claimed their results showed a variable D:N ratio. More recent observations, however, have largely confirmed the truth of Minkowski's work, showing that the maximum diabetes which can be produced from a complete pancreatectomy produces a dextrose to nitrogen ratio of 2.8:1.

More recently Lusk and Stiles[6] (working with diabetes produced in animals by the subcutaneous injection of phlorizin) found that the ratio as established by Minkowski did not represent the maximum dextrose to nitrogen excretion which is obtainable. Phlorizin acts by mobilizing all sugar which is deposited as glycogen in the animal body, and causes it to be excreted through the kidney. Subsequently phlorizin is able to prevent any more sugar from being deposited in the tissues as glycogen. When an animal is being so treated, it rapidly becomes free from all deposited glycogen, and the sugar excretion strikes a constant ratio to the nitrogen output. This ratio was found to be 3.65 gm. of sugar to 1 gm. of nitrogen. As 6.25 gm. of protein (when completely utilized by the body) leaves a residue of 1 gm. of nitrogen to be excreted, it is apparent that there is available from 6.25 gm. of protein 3.65 gm. of sugar, or about 59 per cent. of the protein molecule is converted to sugar in the animal body.

These results were later confirmed by Mandel and Lusk,[7] working with severe human diabetes. Their patient was kept on a diet of fat and protein, and soon the urine showed 3.65 gm. of sugar to each gram of nitrogen. This condition existing in the diabetic was termed the "fatal ratio" by Lusk, as he believed no patient showing such a proportion of sugar output to nitrogen excretion could recover.

The Lusk dictum has generally held true until the establishment of the starvation treatment for diabetics. There were just two instances of absolute diabetics to my knowledge who were treated prior to the institution of starvation treatment and were apparently relieved by our previous methods. These two cases were reported by Foster[3] and Greenwald.[2] The subsequent course of their patients was not recorded. Up to two years ago the fact that only two cases of survival from complete diabetes were reported confirmed the truth of Lusk's dictum, under former methods of treatment.

Since the adoption of starvation treatment, however, Geyelin and Du Bois[4] reported one case of recovery from the "fatal ratio" with subsequent return to a fair degree of sugar tolerance. This case in many respects was very similar to that of the patient under discussion. In both instances the sugar tolerance was reduced in potential diabetics to approximately the least level by acute infections. The two showed return of sugar tolerance to approximately the same degree.

As indicated in the table, the patient whose case I have reported showed a dextrose to nitrogen ratio of 3.93:1 on one instance and as low as 1.27:1 on another instance. However, the average of dextrose to nitrogen excretion for the entire thirteen day period was 2.5:1. On the two days on which he received 10 gm. of carbohydrate in the form of greens, it will be observed that the ratio dropped below 2:1. I do not believe that the carbohydrate was converted to sugar in the patient because the greens appeared in the stool unchanged in a very brief period. If they were not utilized as sugar, the patient's ratio was 2.6:1 on these two days, which would be quite consistent with the ratio on other days.

The results on these two days also give very good presumptive evidence that fat is not converted to sugar in the diabetic; for on both days the patient was supplied with 25 gm. of fat, and if it had been converted to sugar, the dextrose to nitrogen ratio should have been greater, whereas it was lower.

2. This patient showed a very great increase in nitrogen metabolism which persisted for the first nine days of his stay in the hospital. It will be noticed that on the tenth day the nitrogen excretion fell off very markedly and never at any later period showed an increase. On the second day of the test diet, however, when the patient was getting a very liberal supply of nitrogen in his food (16 gm. daily), he excreted 8 gm. in excess of his intake. This shows that he was using 50 gm. of his own body protein besides the amount which was taken in the diet. On the second day of starvation the nitrogen excretion was the greatest of any day while the patient was fasting. It was on this day that the patient's condition was at its worst, the tension of carbon dioxid reached its lowest point, and the acetone and diacetic acid excretions were the greatest for the starving period.

Excess nitrogen excretion has been observed many times in severe diabetes. Numerous authors have described cases which showed many times greater excretion than this patient. The most interesting thing, however, was the subsidence of the excess elimination of nitrogen in this patient when he was in the period of "fatal ratio." The causative factors of excess nitrogen excretion in the diabetic are not clear. It cannot be explained by the fact that the patient had an infection with fever. Both of the latter factors persisted long after the excess nitrogen excretion subsided. Neither can it be explained from the failure of this patient's body to utilize carbohydrate or from excess fat metabolism, for both of these conditions were constant during the period of excess nitrogen excretion and afterward.

Von Noorden[8] attributes excess protein metabolism in diabetes to some toxic substance which is retained in the body. It appears that such a possibility could have existed in this case. The few days of starvation which preceded the subsidence of excess nitrogen elimination might have been sufficient to allow the patient by some mechanism to eliminate a supposed toxic material.

3. The carbon dioxid tension of this patient was very low on admission, and it went down decidedly during the first two days of starvation. After the second day of starvation the tension gradually mounted, and reached a perfectly normal figure by the time the "fatal ratio" had disappeared. It is also interesting to note that on the day the carbon dioxid tension reached the lowest level, the nitrogen, acetone and diacetic acid excretions were the greatest. These factors are doubtless related to each other. On the same day the patient's general condition was distinctly worse, he appeared toxic, his respiratory rate was 25 to the minute, and he was decidedly stuporous. There was grave fear that if starvation was continued the patient would go into coma. We considered terminating the fast and giving the patient more alkali. It was not

6. Lusk and Stiles: Am. Jour. Physiol., 1913, **10**, 67.
7. Mandel and Lusk: Deutsch. Arch. f. klin. Med., 1904, **81**, 479.
8. Von Noorden: Diabetes, 1905, p. 114.

done, however, and on the following day the patient was in much better condition, and as the alveolar carbon dioxid tension had come up slightly, there was more encouragement to continue the fast. From this time on the carbon dioxid tension gradually rose, and the patient's general condition was quite commensurate with it.

4. The excretion of acetone bodies fell off markedly on the first day of starvation, and continued at a low level until the fast was terminated, and finally disappeared from the urine after the sugar tolerance was established. Unfortunately, beta-oxybutyric acid determinations were not made in this case, but doubtless it follows the same course as its companions, by disappearing from the urine as the carbohydrate tolerance is gradually raised. The reduction of these acid bodies in the urine promptly with the institution of starvation, has been one of the particularly illuminating points which has been brought out by our recent methods for the treatment of diabetics. It will usually be found that there is a prompt reduction of the daily ammonia excreted in the twenty-four hour urine to the total nitrogen output. This case showed what in former times would have been considered an alarming figure, but it will be noticed that the same percentage was eliminated day after day, some time after the patient recovered from the acidosis, so far as the carbon dioxid tension was concerned. Our former view in regard to the excretion of ammonia in acidosis as a protective mechanism is not tenable in the light of our present knowledge. It will have to be explained on some other basis. It certainly is of little service as an index to acidosis.

6. This patient was starved eleven full days. The only food taken during that time is enumerated in the table. He had 180 c.c. of whisky daily, black coffee as desired, and on two days 10 gm. of carbohydrate and 25 gm. of fat. This, I believe, is the longest period any patient has been starved to render the urine sugar free. It might have been possible to make this patient's urine sugar free by alternate starvation days, but after all I think in this instance that fasting as employed

LABORATORY DATA

Date	Urine Volume C.c.	Reaction	Acetone Diacetic Gm.	Total Nitrogen Gm.	Ammonia Nitrogen Gm.	Ammonia Percentage Total Nitrogen	Total Urine Sugar Gm.	Blood Sugar per 100 C.c. Gm.	D-N	CO_2 Tension, mm. Hg	Weight Kg.	Diet			
												Carbohydrate Gm.	Protein Gm.	Fat Gm.	Whisky C.c.
1/15/16	3,400	Acid	3.33	18.5	5.8	31	108.8	.393	3.18:1	24.5	50.9	50	100	..	....
1/16/16	1,450	Acid	2.90	24.2	7.3	30	108.3	.400	2.4 :1	26.1	50	50	100	..	....
1/17/16	1,700	Acid	....	13.4	5.8	28	52.7	.400	2.93:1	23.2	50	Starvation		..	180
1/18/16	2,100	Acid	1.80	15.9	4.5	28	39.9	.342	2.51:1	20.7	50	Starvation		..	180
1/19/16	2,120	Acid	.91	10.5	3.9	37	24.3	.304	3.57:1	22.6	49.8	Starvation		..	180
1/20/16	1,800	Acid	1.30	12.2	4.3	35	34.	.337	1.97:1	26.6	49	10	...	25	180
1/21/16	2,550	Acid	....	14.1	5.1	36	33.1	.308	1.6 :1	24.1	49.1	10	...	25	180
1/22/16	2,480	Acid	....	12.6	3.7	30	33.6	....	2.77:1	30.6	48.8	Starvation		..	180
1/23/16	2,650	Acid	....	11.3	3.4	30	29.9	.400	2.64:1	31.1	48.4	Starvation		..	180
1/24/16	1,800	Acid	.80	6.8	2.1	31	18.9	....	2.77:1	35.2	48	Starvation		..	180
1/25/16	1,900	Acid	....	8.	2.7	33	26.6	....	2.32:1	....	48.2	Starvation		..	180*
1/26/16	1,155	Acid	.60	5.3	...	...	9.3	.257	1.75:1	37	49.1	Starvation		..	180
1/27/16	1,650	Acid	....	4.1	1.5	36	5.2	.285	1.37:1	....	49.8	Starvation		..	180
1/28/16	1,500	Acid	....	7.5	2.6	34	Tr.	....	.....	36.8	50.9	10	...	25	180
1/29/16	1,600	Acid	1.03	5.1	1.4	27	....	.190	.....	....	51.4	15	...	50	180
2/ 1/16	2,000	Acid	.80	4.9	1.0	21	....	....	.....	....	50.4	50	...	100	180
2/ 3/16	1,800	Neut.	Tr.	...	...	..	....	....	.....	....	50.8	40	55	175	...
2/10/16	600	Neut.	Tr.	...	...	..	....	....	.....	....	48.2	45	55	200	...
2/25/16	1,720	Neut.	Tr.	9.44	1.36	15	12.5	....	.....	....	49.3	50	55	225	...
2/ 5/16	1,800	Neut.	....	...	...	..	....	....	.....	....	50.8	60	55	225	...

* Patient ate small amount of oatmeal that he took from another patient's tray.

excretion of acetone, diacetic acid and beta-oxybutyric acid when the diabetic is cut off from the external supply of the precursors of these acid bodies, namely, fat and protein. However, they will persist in the urines of these patients as long as they are living on a diet of fat and protein to the exclusion of carbohydrate food. During starvation, of course, the only food the diabetic receives is that which is obtained from the body tissues; and since they are all largely glycogen free, it is apparent that they are living chiefly on a diet of fat and protein. They will, then, of necessity excrete varying quantities of acid bodies. This excretion of acetone, and diacetic and beta-oxybutyric acids will continue until such time when the patient is eating and assimiliating enough carbohydrate food to prevent their formation. The amount of carbohydrate necessary to prevent the formation of acid bodies varies with different patients. In most patients 75 gm. of carbohydrate are required to insure the complete combustion of fat and protein, but some diabetics have been observed whose urine remained free of these acid bodies to crude tests on 30 gm. of carbohydrate daily.

5. Another method which we formerly employed to determine the degree of acidosis was the ratio of was the safest and quickest method. Had we delayed, doubtless the patient's infection would have advanced very rapidly, and perhaps the acidosis would have increased just enough to throw him into coma. As it was, the sudden withdrawal of substances which were producing acid bodies in his system (namely, fat and protein) was sufficient to avert coma, and quite sufficient to allow him to recover from his acidosis before the fast was terminated.

Diabetics of an extreme degree should never be starved without constant watch being kept on the tension of carbon dioxid in the alveolar air. There is no satisfactory method for the measurement of acidosis aside from carbon dioxid determinations. Methods requiring body excretions are inaccurate, and are usually not available when needed. Carbon dioxid determinations can be quickly made, and will give instantly the condition of the patient. These patients may go extremely acid with great suddenness.

Irreparable harm may be done by such long starvation periods in the diabetic. It may be the cause of lighting up an old tuberculous process, or so reduce the patient's nutrition that the body would be an easy prey to any infection. But this question must be

characterized by perceptible recession of the chin. This may be due to the action of the geniohyoglossus muscles in their constant efforts to open the jaws. There is also a general atrophy from disuse of all the tissues of the lower jaw, including the mentalis and quadratus labii inferioris muscles. The deformity may be so exaggerated as almost entirely to obliterate the chin. Usually when the ankylosis has been established on one side in early childhood by trauma, and the disease has slowly progressed until the normal structure of the joint has become obliterated and the jaws closed, the opposite side also will be more or less affected on account of the disuse of the joint.

DIAGNOSIS AND TREATMENT

The differential diagnosis in the character of the ankylosis is not a complex problem. In fibrous ankylosis, even though the adhesion is quite firm, there will be some movement, especially lateral movement in the jaws. In bony ankylosis, the only movement which can be observed is the very limited movement of the elasticity of the structures involved. There can be no lateral movement in the lower jaw in intra-articular bony ankylosis.

The treatment of intra-articular bony ankylosis consists in surgical measures. Forced separation of the jaws will avail nothing. The surgical procedure consists in establishing pseudarthrosis, either in the site of the true joint or below it. Esmarch, in 1855, suggested an operation for intra-articular bony ankylosis by the removal of a wedge shaped section of bone, with base downward, three-quarters inch long, from the horizontal portion of the mandible. This did not prove satisfactory on account of the disturbance of the normal action of the masticatory muscles which followed. König, in 1878, introduced the operation of resection of the mandibular head. The results were unsatisfactory on account of the possibility of a recurrence.

Fig. 2.—Exposure of the joint.

Brophy[3] states that he has obtained very satisfactory results by removing a crescent shaped section of bone from the region of the angle of the jaw. He places gutta percha between the ends of the bones which prevents the freshened ends of the bones from uniting. The gutta percha is allowed to remain for a period of six weeks, after which the wound is reopened and it is removed. During this time, it is asserted that a well organized membrane is formed which seems to form the intra-articular tissue.

The operation which has been very satisfactory in my experience is the operation similar to the one reported by Lilienthal,[4] in which a section of bone is removed from the condyle.

Technic of the Operation.—Beginning about 5 mm. in front of the tragus of the ear, a horizontal incision is made through the epidermis and superficial fascia along the lower border of the zygoma, extending anteriorly for a distance of about 3 cm. A vertical incision is then made through the epidermis and superficial fascia, extending upward from the point of beginning about 4 cm., running just in front of, and parallel to the ear (Fig. 1). The epidermis and superficial fascia are now dissected up to form a flap. The underlying tissues containing the branches of the seventh nerve and also the superficial vessels are pushed aside by the use of retractors and blunt dissectors until the joint and a portion of the condyle is laid bare (Fig. 2). Great care must here be exercised that the zygomatic and temporal rami of the facial nerve are not torn in the effort to expose the bone.

After the neck of the condyle has been cleared of the tissues by blunt dissection, a full curved aneurysm needle is used for the purpose of guiding a steel ribbon $\frac{3}{1000}$ inch in thickness and 1 cm. in width, back under the condyloid neck (Fig. 3). This is for the protection of the internal maxillary artery in removing the section of the condyle. The section is removed by the use of the mastoid chisel, taking out about 1 cm. of the bone, including the periosteum. Then a flap of superficial fascia is elevated from the temporal muscle and interposed between the ends of the condyle, and sutured with catgut sutures. The wound is then closed with horsehair.

After the excision of a portion of the condyle, as indicated, has been accomplished, on one side, an attempt should be made to open the mouth. If the jaws cannot be opened, the same operation should be resorted to on the opposite side, when of course the jaws will be free. No attempts should be made to stretch the jaws or hold the mouth open until partial repair of the soft tissues has been obtained. After about the fifth day, my treatment has been to begin opening the mouth by the use of a graduated mouth gag. The patient will experience considerable pain at first, but the mouth should be opened until there is at least a space of 2 cm. between the opposing cuspid teeth. When this space is obtained, the graduations on the gag are noted and the gag placed in the same position in the mouth and opened to the same degree, four or five times each day. Each time the gag is inserted, it is left in position for a period of five minutes. This treatment of stretching the jaws should be maintained for several weeks, the patient doing this himself, after being properly instructed.

Dangers, Disadvantages and Complications of the Operation.—One of the greatest dangers involved in the operation is that of infection. Owing to the close proximity to the hair line, there is a greater possibility of infection either in the wound at the time of operation, or subsequently, than in wounds of like nature elsewhere on the skin surfaces. Therefore the greatest precautions must be exercised that everything connected with the operation should be absolutely sterile and that extra precautions be taken in the subsequent dressings of the wound, that infection be warded off. An infection in the wound may ruin what would otherwise be a successful operation.

Necessarily after repair has taken place, there is more or less cicatricial tissue at the point of operation, which leaves a scar and sometimes more or less of a depression at the point of the false joint; but this; in my opinion, is of secondary importance. The dangers

3. Brophy: Oral Surgery, the Diseases, Injuries and Malformations of the Mouth and Associated Parts, Philadelphia, P. Blakiston's Son & Co.
4. Lilienthal: Ann. Surg., August, 1911.

to be encountered in the operation are, first, the inability of the anesthetist to control the tongue during the administration of the anesthetic. Some cases are on record in which tracheotomy had to be resorted to during the operation. Second, danger of injury to the temporal rami of the seventh nerve, whereby paralysis of the orbicularis oculi muscles may follow. Another danger to be encountered is injury to the internal maxillary artery. This vessel lies directly in the field of operation, and must be protected in some manner in removing the segment of bone in the process of forming the new or false joint. This may be accomplished by retractors, Murphy's periosteotomes, or any other instruments which may be easily inserted between the artery and the neck of the condyle. I believe that the steel ribbon which I have described is superior in the simplicity of its application, and effectiveness, to anything which has been called to my attention.

Fig. 3.—Insertion of steel ribbon.

CONCLUSION

It might be stated that, outside of the dangers enumerated, this operation is comparatively free from serious complications or sequelae. The patient begins the mastication of his food in about ten days to two weeks following this operation. The movement of the jaws prevents the formation of too much fibrous tissue between the two ends of the bone, and after repair is completed, it will be found that the tissue which had become atrophied begins to take on a more nearly normal condition. The patient takes on weight, the general health and appearance improve, and he again resumes confidence in himself. The correction of ankylosis of the temporomandibular articulation is an operation which not only gives great satisfaction to the patient, but also is one which is very gratifying to the operator.

ABSTRACT OF DISCUSSION

DR. H. A. POTTS, Chicago: These results of injuries and infections are really more common than the general practitioner seems to think. Quite frequently we see, in large clinics, patients who present the same appearance as this one. The diagnosis as to the form of ankylosis is very important, and judging from the experience of previous operators and the conditions found at operation, the operation here described is certainly of the type which is best suited to the bony ankylosis. The dissection of fibrous bands and the treatment of the various classifications, as given, would permit of other treatment, but the bony ankylosis is best treated. Dr. Lyons is to be congratulated on the result in this case, which, if the patient does his part, will avoid a further complication, or even lessening of the space already gained.

DR. CHALMERS J. LYONS, Ann Arbor, Mich.: Of course, in these cases the patients must do their part. They are instructed to keep constantly stretching the jaws. These instructions are very important. More can be accomplished by this stretching than by anything else, doing it several times a day, to keep the space already gained. This man has gained a little more space by this exercise.

DR. POTTS: If you put the index finger on the upper teeth and the thumb on the lower teeth, you can get a good deal of force in stretching.

DR. LYONS: That is a good suggestion. These exercises must be kept up continuously. In these cases, if nothing is done, there is a great tendency for the ankylosis to recur.

CALCIFIED HEMATOMA*

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DETROIT

Interest in the occasional development of bone masses in and beneath muscle following trauma has been great, especially since the Roentgen ray has made possible their clear demonstration. The condition has commonly gone under the name of myositis ossificans traumatica, because it has been believed that damaged muscle is actually changed into bone. Other names have been suggested depending on various theories of origin; for example, calcified hematoma, based on the theory that the blood clot following an injury becomes calcified, and periosteal callus, on the theory that the growth is merely misdirected callus formation. The best known theories so far put forward are, first, the hemic theory (Sadeler). This theory supposes that the hemorrhage following an injury to muscle is first transformed into cartilage which later ossifies. Second, that the tumors are aberrant sesamoid bones (Bard). Third, the theory that the growths result from bits of periosteum detached and included in the muscle. Fourth, that the fibrous tissue of the muscle undergoes a true metaplasia into bone. Fifth, that the bone develops from cells disseminated from the periosteum through the hemorrhage. All these theories have warm supporters and antagonists.

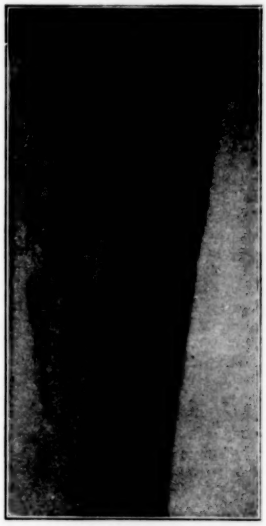

Fig. 1.—Before operation.

The best discussion which has come to my attention of the surgical and pathologic aspects of this condition

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

is that published by Fay.[1] He favors the combination theory in which both the periosteum and the fibrous tissue of the muscles take part.

Much of the confusion as to the origin of these growths is due to the fact that sometimes the bone

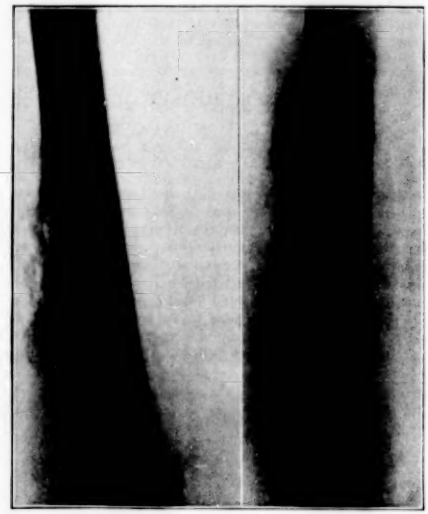

Fig. 2.—Present time.

mass is attached to the periosteum, and that sometimes it lies within the muscles without periosteal connection, most commonly in the brachialis anticus or the quadriceps. This difficulty is easily overcome by the assumption, which I believe to be a reasonable one, that there is always, at some time, a direct connection with periosteum which may or may not be absorbed or broken off by muscular action. In support of this assumption is Coley's[2] statement that recurrence can best be avoided by covering the periosteum with a fascial graft.

The following case aroused my interest in the subject, and is, I believe, worth reporting in the hope of shedding a little more light on the causation of the condition:

W. B., vigorous schoolboy, aged 16, was without disease or family taint. Five weeks before he was seen, March 21, 1916, he was kicked on the front of the thigh during a basketball game. There was immediate pain and stiffness, but he continued the game. Next day pain was rather severe and he was forced to limp. Pain gradually passed off but the stiffness did not decrease, and for the past two weeks had been increasing. Examination showed a slightly tender, hard mass involving the middle third of the front of the thigh. The muscles moved over it to a certain extent, but flexion of the knee was possible to only about 15 degrees, a severe pulling sensation preventing further motion. Probable diagnosis of calcified hematoma was made. Roentgenograms taken at the time showed a long mass, with the character of bone, lying close to the front of the femur, to which it was attached at one point.

The possibility that the mass was sarcomatous made exploratory operation advisable. This was done, March 22. An incision, just in front of the iliotibial band, at the outer side of the growth, was carried through the fascia lata, and the muscles separated by blunt dissection. A mass of vascular new bone was found, surrounding the anterior half of the middle third of the femur. Anteriorly it was firmly adherent to the vastus medius by many torn and partially destroyed muscle fibers which issued from the bone substance. These anterior attachments were easily separated and the bone found to be firmly adherent, at about its middle, to the surface of the femur. With considerable difficulty the mass was pried loose and removed. At the point of adhesion to the femur was found an area one-half inch in diameter, where the bone was denuded of periosteum. The perimeter of this denuded area was made up of much thickened and edematous vascular periosteum with ragged edges. The thickening gradually decreased in all directions for a distance of three-quarters inch, at which point the periosteum became normal.

Feeling convinced that the mass originated from the periosteum at this point, the denuded area and the edges of the thickened periosteum were carefully covered with bone wax in the hope of preventing further overgrowth. The specimen was sent to Dr. C. R. Meloy of Grace Hospital, to whom I am indebted for the microscopic slides. The patient made an uneventful operative recovery and was about in ten days. Two weeks later he had about 45 degrees of motion in the knee, and was rapidly gaining more motion. At that time, he sustained a severe wrench, whereupon the stiffness promptly

Fig. 3.—Cartilage formation.

reappeared, and there was very marked induration of the deep tissues of the front of the thigh, which closely resembled the original growth. Since, this has gradually disappeared and motion is constantly increasing. The roentgenograms taken at present show that the growth has been stopped and that the remains of it are absorbing. The microscopic sections taken from various parts of the new bone are of

1. Fay, O. J.: Parosteal Callus, the So-Called Myositis Ossificans Traumatica, Tr. West. Surg. Assn., 1913, p. 174.
2. Coley, W. B.: Myositis Ossificans Traumatica, Ann. Surg., 57, 305.

extreme interest, in that they show all stages of bone formation. The whole mass is surrounded by a fibrous tissue capsule, in the meshes of which can be seen partially destroyed muscle fibers. These are scattered all through the growth. From this capsule, cartilage is growing, as is bone.

Fig. 4.—Muscle surrounded by bone and fibrous tissue growth.

There are areas of transformation of cartilage into bone, and areas of fibrous tissue undergoing myxomatous change with a substitution of cartilage cells, evidently a direct change in cell character. The picture, therefore, is that of callus formation originating in the periosteum. Everywhere the picture is that of muscle destroyed by an invading growth, rather than muscle changing into bone. The muscle bundles are evidently infiltrated and destroyed, not actually forming new tissue.

Clinically this case is an example of successful operation for the removal of a large and necessarily disabling bone growth. The failure to recur I believe to be largely dependent on the use of the protective film of bone wax at the point of periosteal injury. Pathologically I believe the course of events to have been something as follows: The original traumatism tore deep muscle fibers, and at the same time caused a break in the periosteum. From both sources blood was poured out, and immediately deeper layers of periosteum responded to the stimulus of trauma by pouring forth osteoblasts. These were free to wander through the mass of hemorrhage, which, in this case, occupied only the deepest layers of muscle tissue. A delimiting fibrous tissue membrane was formed by the intramuscular fibrous tissue as a preparatory step to the absorption of the blood clot. On this membrane and its meshes were deposited the free bone-forming cells, and from all directions bone growths began. Had the hemorrhage lain deeper in the body of the muscle or had the tear in the periosteum been smaller, it is easy to see how the connection between the two might have been obliterated within a very short time, and the bone growth have become entirely enclosed within the muscle body. Had this occurred, Roentgen rays would have at no time shown connection between the growth and the periosteum, because the connection would have been severed before sufficient calcium was deposited to throw a shadow.

Although I realize that the evidence of this case is far from conclusive, its presentation is justified on two grounds, first, because the apparent course of events is so plain and easy to understand, and second, because the theory which it seems to substantiate is a simple one. Metaplasia of one tissue into another, even under extraordinary stimuli, is a difficult conception. Overproduction of the tissue from its usual source is a simple one.

David Whitney Building.

ABSTRACT OF DISCUSSION

DR. W. C. CAMPBELL, Memphis: I have had two similar cases, both of which were infected. The first case occurred in a young boy, 9 years of age, who was referred to me for tuberculosis of the hip. The roentgenograms showed a ring of bone in the region of the lesser trochanter. Stereoscopic roentgenograms showed this ring of dense bone, about the size of half a dollar, to be posterior and slightly external to the lesser trochanter, and not connected with it in any way. There was a sinus running from just below the greater tro-

Fig. 5.—Bone growing from capsule.

chanter tortuously through the thigh at the level of the lesser trochanter, opening internally in the perineum. Bismuth injection of the sinus brought it out quite clearly. I found at operation that there was no connection whatever with the bone. There was no erosion, and the periosteum was intact; but the condition was of two years' duration, and had followed an injury. The result was complete cure, with no recurrence

after two years. The second case was that of a man, aged 30, who gave no history of injury. This case was also referred with an erroneous diagnosis of tuberculous knee. The knee was red and fluctuating. Operation showed an irregular mass anterior to the femur, just above the knee joint. The mass was easily removed, and the patient made an uneventful recovery, except that the knee was involved and required further work. Microscopically the mass removed was bone and not calcium deposits, as frequently occur in suppurating areas. These cases were interesting, because both were infected, one with a sinus, and the other having no sinus.

DR. JAMES T. WATKINS, San Francisco: I operated on a youth, aged 16, who, while playing football, had received a kick on the external aspect of the lower end of the thigh. He was not more than temporarily discommoded, but later noticed at the site of injury a lump which was painless, but gradually increasing in size. He wanted to enter the Naval Academy, but had been told that this deformation would exclude him. For this reason he wished it removed. So I cut down on the femur and chipped the mass off. The muscle was not particularly adherent to it. It did not occur to me to cover the cut surfaces as Dr. Kidner did so as to prevent a recurrence. However, there was no recurrence. Macroscopically it looked more like cartilage than bone. The pathologist reported it to be a mixed cartilage and bone tumor and of a benign nature.

DR. J. D. GRIFFITH, Kansas City, Mo.: These growths occur not only connected with those parts of the body where bones or periosteum are, but also elsewhere. On two different occasions I have taken such a growth out of the abdominal muscles. These specimens gave the evidence of bone structure. My cases seem to show that in all instances the growth is not periosteal.

DR. FREDERICK C. KIDNER, Detroit: In regard to the question of origin of the bone in these unusual growths, I would say that I limited my paper to the purely traumatic cases following on severe injuries. Such cases as Dr. Campbell mentioned are very often the result of an infection, and the masses consist of calcium deposits, rather than bone. I should like to know whether the masses were examined in Dr. Campbell's cases.

Fig. 1.—A small papillomatous growth occurring in the mucous membrane of the cheek opposite a jagged tooth in a man, aged 50.

DR. CAMPBELL: Yes. They were both necrotic bone, and the condition followed injury in one instance.

DR. KIDNER: The element of chronic infection and of irritation enters here, and it is easy to conceive that the periosteum might be healed after the bone mass was formed. In regard to the masses in other places, where there is no bone near, I do not think that we know much about them. I am not willing to advance any theory on that subject.

Influence of Caffein on Toxicity of Morphin Sulphate.—From results recently obtained in experiments on cats and guinea-pigs by C. C. Haskell and A. B. Siewers (*Virginia Medical Semi-Monthly*, Dec. 8, 1916), it would appear that the employment of large doses of caffein is not devoid of actual danger, and instead of lessening the toxicity of morphin sulphate, really renders the chance of the animal's recovery less probable. They do not urge these results as evidence that caffein should not be used in the treatment of poisoning by morphin sulphate or other opium preparations, but that some limit should be placed on the amount of caffein used in the treatment of opium poisoning and that more attention should be paid to removing the unabsorbed morphin and hastening the elimination of that present in the circulation.

A CLINICOPATHOLOGIC STUDY OF EARLY MALIGNANT CONDITIONS OF THE FACE AND MOUTH*

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The great latitude accorded the term "precancerous" has led to its application to a variety of lesions both cancerous and noncancerous. For the sake of clearness in thinking it would be well to keep separate those lesions which may ultimately terminate in cancer from those cases which have recently assumed definite malignancy. It is of the greatest importance to the patient, however, that a malignant condition be eradicated completely while it is still a local process.

The majority of so-called precancerous lesions represent an incomplete or perverted reaction to some form of chronic irritation. When the cells of any tissue are injured or destroyed, there is an attempt at repair, and the neighboring cells are stimulated to reproduction. Normally the development of these cells goes on at a rate equal to or greater than that of the most malignant of tumors, and they soon reach maturity. In some cases, however, because of an influence of which as yet we know but little, these cells do not reach maturity but persist in a partially developed state and continue the process of reproduction far beyond the normal limits. Thus a group of cells are formed which are not coordinated and correlated with the normal growth processes but are more or less independent of them. To these the term "cancer" is applied.

About the face and mouth, carcinoma arises from one of three types of cell:

1. The squamous epithelium of the skin and mucous membrane, giving rise to the epidermoid carcinoma or epithelioma.

2. The cell of the hair follicle, giving rise to the hair matrix carcinoma or the often erroneously called basal cell carcinoma.

3. The epithelium of the glands associated with the skin and mucous membrane, giving rise to the various types of glandular carcinoma.

The most frequent tumor of this region is the epidermoid or squamous cell carcinoma. The patients bearing this type of tumor give a history of having some form of lesion preceding the development of the cancer. The smoker's burn is one of the frequent initial lesions described by these patients. A small

*Read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

blister occurs which may disappear and reform again. The histopathology of such burns has been so accurately and completely described by Bloodgood[1] that it will not be discussed at this time.

In the order of frequency, the next "precancerous" lesion occurs as the result of mild traumatism repeated frequently over long periods of time. The irritation of a jagged tooth, or in many patients the habit of holding nails, screws, etc., in the mouth can be discovered in taking the history. Other lesions in which carcinoma develops are fever blisters, cracks, fissures, cuts which have refused to heal under ordinary care, papillomas and areas of leukoplakia. The last lesion would appear to be a very important one when cancer of the tongue is under consideration, as each of the patients in the seven cases in this series gave a description of the initial lesion as a thickened, hard area on the tongue.

While the history of traumatism can be elicited in the majority of cancer cases of this region, and especially those of the lip, there are many lips which have been injured in a similar way and which do not develop cancer. In the last eighteen months we have seen two smokers' burns which, after persisting for a couple of months, disappeared and have not returned, and a sore developing in a fever blister which existed for nearly three months and then went away. Whether these will return and malignancy develop in them, of course, cannot be said. It would appear, however, that there is at work in the development of cancer some factor or factors other than simple injury.

Injuries of the types described do apparently determine the location of the cancer in those individuals in which these other factors are operative. Of interest in this connection is the work of Miss Slye.[2] She reports that cancer of the oral region is not frequent in mice, even in those strains in which the majority die with cancer. Injury to these parts is also infrequent in these animals, whereas it is common in man.

These conditions may persist without visible change for some time, but more often they gradually spread and break down, forming an ulcer. This is usually of an irregular shape, having rather indurated edges which are not undermined. The base is smooth and grayish. There is often a thin, irritating discharge. Around the edges is a zone of bluish discoloration containing blood vessels. This is a picture of a fully established cancer. Its persistency is a significant warning, and when such a lesion is found about the face or mouth in a patient over 35 years of age, it should be removed quickly. Too much emphasis should not be placed on the age, for each case is more or less a law unto itself. For instance, we recently studied a case of carcinoma of the tongue which began in the twenty-seventh year of the woman's life.

In the twenty-two carcinomas of the face occurring above the line of the lower lip in the series which forms the basis of this study, twelve were of the hair matrix variety. In larger series the proportion of this type is usually greater. These tumors take their origin from the cells comprising the hair follicle. They usually begin as a subcutaneous nodule. After persisting for a variable period they break down and ulcerate. They present a tendency to infiltrate widely but not deeply, and seldom produce metastasis. A free excision results in complete cure in the vast majority of cases. It is in this type of cases, especially those situated about the nose and eyes, that the use of caustics, while often successful, will occasionally render the growth inoperable. The location must therefore be taken into consideration in selection of the method of treatment.

Fig. 2.—A papilloma on the tongue in a woman, aged 27. There was recurrence because of incomplete removal. Second excision successful.

Fig. 3.—Both an exudative (lymphoid in character) and a proliferative reaction are shown about the invading tumor cells. From a specimen of early epidermoid carcinoma of the lower lip.

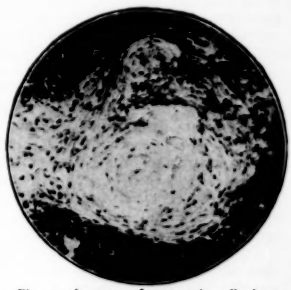

Fig. 4.—A group of metastatic cells in a lymph node of the neck associated with an epidermoid carcinoma of the lower lip which began in a razor cut. Radical operation with no recurrence at the end of the third year. Note the cornified mass to which the tumor cells are being reduced.

The tumor cells may be cuboidal, cylindrical or spindle shaped. They are characterized by a small amount of cytoplasm and by the fibrils which they produce. At times they occur in a densely packed arrangement and, when of spindle shape, resemble a sarcoma quite closely.

Occasionally a glandular carcinoma is seen about the face. Only one of the type occurred in this series — a mucous gland, adenocarcinoma — arising in the floor of the mouth and extending over to the tongue and involving it.

The connective tissue lesions occurring on the alveolar border form an interesting group of tumors usually referred to as epulides. The soft or giant cell variety is the one type about which wages the controversy as to malignancy.

The misunderstanding which has existed in the past concerning the exact nature of the giant cells found in neoplasms has contributed to this confusion. The

1. Bloodgood: Carcinoma of the Lower Lip, Surg., Gynec. and Obst., 1914, **18**, 404.
2. Slye: Inheritability of Cancer in Mice, Jour. Med. Research, March, 1915, p. 193.

separation by Mallory[3] of true tumor giant cells from those of the foreign body type found in tumors has cleared the field in regard to the giant cell epulis. In the majority of instances, the giant cells are all of the foreign body variety. Again, these tumors may be confused with a malignant type of tumor of endothelial origin which exhibits intravascular giant cells and has been reported by Whitman[4] and Ivy.[5]

Fig. 5.—An early epidermoid carcinoma of the lower lip. Patient is a plumber who has the habit of holding nails, etc., in the mouth.

Since these tumors represent forms of lawless growth of connective tissue cells, the important thing is to find out just what these cells are doing. The rate of the growth should be ascertained by a histologic study of them, searching for mitotic figures, and determining the degree of differentiation to which they are attaining. It should be noted whether these cells are arranging themselves in a position normal to connective tissue, or whether they are atypical in form and arrangement. In a word, they should receive the same study as do connective tissue tumors elsewhere, and the diagnosis and prognosis be made accordingly.

The prognosis of giant cell epulis, in general, is good, provided careful excision has been made. The treatment should consist in a complete removal of the tumor and its point of origin.

Several other varieties of the nonepithelial malignant neoplasms occur in connection with the face and mouth. Sarcoma is a common tumor of the jaw. This tumor may arise from the bone or connective tissue of the region. The symptomatology is largely determined by the location and the rate of growth. Although they

Fig. 6.—A hair matrix carcinoma of the lip.

are rapidly growing tumors there is but little pain until they become ulcerated or involve nerve trunks. These growths should be excised well beyond the line of visible infiltration. If metastasis has already occurred, since it usually takes place by way of the blood stream, the case is hopeless. If in the frankly malignant case the growth is still a local process, complete excision will result in a cure.

As the majority of cancers about the face and mouth are malign..nt epithelial tumors, metastasis to the lymph nodes of the neck occurs rather readily. These metastatic groups of cells, however, may remain inactive for a long time and then take on an increased growth rate. Only a small percentage of the late cases of cancer give rise to metastasis in distant parts. Radical operation, therefore, even in cases which present extensive involvement, gives a surprisingly high percentage of cure.

Cancer of the face and mouth is comparatively easy of diagnosis and accessible for surgical treatment. With this in mind, 3,007 deaths from cancer of the buccal cavity in the United States in 1913 is appalling.

It is our desire to emphasize the need for close cooperation between surgeon and pathologist, and that here as elsewhere in dealing with new growths, the important thing, both in treatment and in diagnosis, is a thorough knowledge of the behavior of the tumor cells in the particular case under consideration.

The end-results of surgical treatment of malignant tumors of the face and mouth compare favorably with those effected by medical science in the treatment of other disease (not considering, of course, the specific treatment such as antitoxin for diphtheria, etc.), somewhere between 60 and 80 per cent. of cures. The earlier the cases are seen the higher the percentage of cures.

Fig. 7.—An adenocarcinoma of the floor of the mouth which promptly invaded the tongue.

The operative technic in this region has reached a high state of perfection. If further headway is to be gained against cancer of the face and mouth, it must be by the education of the public. It is the duty of those who see so many cases after it is too late to educate the dentist, physician and the general public concerning these conditions which so often terminate in cancer, and urge the prompt radical treatment of cancer while it is still a local process. The responsibility, therefore, rests with the stomatologist, the oral surgeon and the pathologist.[6]

ABSTRACT OF DISCUSSION

DR. FREDERICK B. NOYES, Chicago: There was one remark made in regard to the origin of the giant cells, about which I know we have had some rather interesting evidence in the last year in the Research Laboratory of the University of

3. Mallory: Giant Cell Sarcoma, Jour. Med. Research, April, 1911, p. 463.

4. Whitman: Giant Cell Endothelioma of the Gums, Jour. Med. Research, January, 1914, p. 465.

5. Ivy, R. H.: Mesothelial Tumors of the Jaws, THE JOURNAL A. M. A., Jan. 2, 1915, p. 40.

6. In addition to the references already given, the following will be found of interest:

Blair: Tumors of the Mouth—a Collective Review, Internat. Abstr. Surg., January, 1916, p. 117. (This gives an extensive bibliography.)

Forman: Some Phases of the Cancer Problem, Ohio Pub. Health Jour., **7**, 21.

Hoffman: Some Essential Statistics of Cancer Mortality Throughout the World, Panama Commemoration Volume, Chicago, 1915.

Means, J. W., and Forman, Jonathan: Precancerous Conditions of the Face and Mouth, Dental Summary, **35**, 945; Epulis, ibid., **36**, 494.

Tyzzer: Tumor Immunity, Jour. Cancer Research, April, 1916, p. 125.

Illinois. The character of the giant cells in the tumors about the mouth is characteristic of origin by fusion of other cells in the region.

DR. H. A. POTTS, Chicago: The most important thing to be learned from the paper is the great importance of recognizing the possibility of these precancerous lesions. The chief thing is to avoid irritation. Any wound or abrasion on the mucous membrane of the mouth, lips or face, which does not heal or show a tendency to heal within ten days or two weeks, should be looked on as very suspicious, and should not be treated expectantly. We have all seen these cases. The secret of success in their removal is early and extensive operation to take in all of the growth and metastases as well. The chief point is that we must impress on the general practitioner of medicine and dentistry that these very serious abrasions should be looked after immediately and not given any palliative treatment that extends over a period of two or three weeks.

DR. F. B. MOOREHEAD, Chicago: In the past there has been an error in the classification of tumors of the mouth, particularly of the mesothelial type. A clear distinction should be made between the various forms of benign fibroma, the various forms of sarcoma and the giant cell tumors found in the mouth, which must not be looked on as highly dangerous. We may have, on the one hand, a giant cell tumor, the result of cell fusion, and, on the other hand, a true giant cell sarcoma. The giant celled tumor produced by cell fusion is a distinct pathologic entity, and is peculiar to the mouth. It is not the same either clinically or histologically as the giant celled sarcoma. We have begun the study of these peculiar giant celled tumors in the University of Illinois and hope to have something to say about them at a later date. The term "epulis" should be discarded.

ANKYLOSING OPERATIONS ON THE SPINE

A STUDY OF TWO SPECIMENS IN THE LABORATORY *

LEONARD W. ELY, M.D.
SAN FRANCISCO

The two specimens described here were removed at necropsy.

CASE 1 (E 113).—The patient was a child of about 5 years, operated on for spinal tuberculosis by Dr. Watkins, with Dr. Ely assisting, five months before death. The cause of death was pulmonary embolism. The operation was a typical Hibbs.

The specimen includes six vertebrae, the two lowest thoracic and four lumbar, one of which (the first lumbar) is badly diseased. No motion can be detected in the operated portion between the spines, but the bodies move a little on each other.

Sagittal Section.—The diseased vertebra is crushed into a trapezoid, and its substance is decidedly harder and denser than is that of the other vertebrae, in spite of the fact that anteroposteriorly runs a band of necrotic tissue, so that the two halves (upper and lower) move on each other. This rift in the bone communicates posteriorly with a collection of cheesy material which has pushed the posterior common ligament backward into the spinal canal. The marrow of the affected vertebra appears yellower than that of the others.

The impression one gets in examining the specimen is that too much of the work in the operation has been done above the diseased vertebra, and too little below it. The laminae of the three lowest thoracic vertebrae and of the first two lumbar are united by bone, making of all five a firm bony mass. Of the spinous processes themselves there is no trace. The union is interlaminar, not interspinous.

Examination of the stained slide, which includes the diseased vertebra and those next above and below it, reveals that the diseased vertebra is in the form of a blunt wedge with the apex forward. Its middle portion is worst involved; the diseased area divides the vertebra into an upper and lower portion, and the products of inflammation bulge out posteriorly so as to narrow somewhat the lumen of the spinal canal. The structure of the diseased vertebra is different from that of the vertebrae above and below. It is more transparent, and the contrast between its trabeculae and its marrow is sharper.

Histology.—The upper and lower vertebrae are normal. The marrow in each is lymphoid.

The middle vertebra is badly diseased throughout most of its extent. A small strip of approximately normal lymphoid marrow runs along the lower margin of the vertebra close to the fibrocartilage. The rest of the marrow is badly diseased. Much of it is fibrous marrow, very vascular; much of it is tuberculous. Necrosis of the tuberculous areas is well advanced. Many of the trabeculae are dead, and areas of calcification form a prominent feature. The whole middle portion of the vertebra has broken down, and is represented by a transverse band of necrotic material in which are many areas of calcification. The trabeculae here show well marked rarefying osteitis and are practically all dead. The tuberculous granulations have burst through, have consumed the thin cortex of bone posteriorly, and have formed an abscess beneath the posterior ligament. The abscess contains cheesy granulations, with many areas of calcification, many dead bone trabeculae, and one small sequestrum just discernible by the naked eye. Communicating with the diseased mass, and anterior to the disk between the diseased vertebra and that above it, is another somewhat smaller abscess cavity containing tuberculous granulations, and much necrotic and calcified material. It looks as if it had been formed by the squeezing out of material by pressure on the diseased vertebra. The lamina of the diseased vertebra is united to that of the one above it by bone, and this is separated from the next one above it by a very narrow interval of fibrous tissue in which bone is forming. The lamina of the diseased vertebra is separated from that of the one below it by fibrous tissue, in which no bone formation is taking place. (Evidently at the line of section the band of bony union mentioned above has not been included.)

Fig. 1.—Hibbs operation. Photograph of stained slide, showing diseased vertebra between two sound ones. Bony union at *A*. Natural size.

We have, then, as the result of the operation, bony union in the operated area, and a tuberculous process still active in the body of the vertebra.

This specimen, besides its relation to an ankylosing operation, throws light on a point which has been up for discussion before this section for the past two years. You will remember that Mr. Fraser maintained that tuberculosis started in the synovial membrane, and that circulating toxins caused the marrow in the adjacent bone to change from lymphoid to fatty or myxomatous marrow; not until then could the disease gain a foothold in the bone. From which joint could

* From the Laboratory of Surgical Pathology of Leland Stanford Junior School of Medicine.
* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

the extensive involvement of this vertebra proceed? How is it possible that one vertebra could be so badly diseased, while the vertebra on the other side of the offending articulation escapes entirely? Mr. Fraser, I believe, has confused cause and effect. The fatty and "fibromyxomatous" marrow is not the precursor of marrow invasion, but the sequel. If not the only determining factor in the location of tuberculosis in the bone, at least by far the most important one is the presence of lymphoid marrow. No lymphoid marrow, no tuberculosis.

Fig. 2.—Albee operation. Posterior aspect of specimen showing graft in place.

Case 2 (E 127).—Lumbar spine on which an Albee operation had been performed two years previously by Dr. McChesney. Apparently firm union had taken place. A spondylolisthesis was present, accounting for the paralysis of the lower extremities. A large cheesy mass was present in the body of the fourth lumbar vertebra, well walled off.

Three and a half years previous to death, the left hip had been resected for tuberculosis, and about one and a half years later, an Albee operation had been done on the spine by Dr. McChesney. At about the same time the internal genitals had been removed. The patient had been admitted to the hospital in coma and died two days after admission. Paralysis of the lower extremities was said to have been present for some time.

Anatomic Diagnosis at Necropsy (Dr. Ophüls).—Tuberculosis of intestinal tract, primary tuberculosis of lymph glands, mesenteric, healed. Tuberculosis of spine, lumbar region. Operation, Albee. Tuberculosis of hip (healed). Bronchopneumonia. Cirrhosis of liver. Adiposity general. Liver, fatty. Heart, fatty. Gastritis, chronic.

The specimen consists of the spines of the lumbar vertebrae, the last four firmly joined by a thick bridge of bone, the graft. The graft is firmly united to each spine, so that its exact limits cannot be distinguished, only a ridge where it joins the spines—an irregularity. The soft tissues were firmly attached to the graft as well as to the spines, and their dissection was quite difficult. Dr. McChesney is strongly of the opinion that the graft has grown in thickness since the insertion. Anteroposterior section of graft, and the embedding portion of the spine of first lumbar vertebra were made for study.

Section of a piece of the body of the fourth lumbar vertebra, including the wall of the abscess, includes bone and intervertebral disk. The bone trabeculae stain very poorly. Their margins take the eosin stain well, but not the rest of them. The bone marrow is lymphoid and fatty. None of it is tuberculous. The wall of the abscess is evident—a small fringe of necrotic material, well encapsulated by fibrous tissue. The process is in the stage of healing.

Histology.—The graft appears as a cap of dense bone on the end of the spongy bone of the spinous process. The cortical bone of the latter, as well as its trabeculae, are directly continuous with the bony tissue of the former. The spinous process shows normal spongy bone with lymphoid marrow, and a rather thin cortex on the sides.

Fig. 4.—Albee operation. Bone graft in place. The graft appears as a cap of dense bone on the spongy bone of the spinous process. Photograph of the stained slide, enlarged four diameters.

The graft at its surface, that is, directly under the periosteum, presents a layer of what is presumably new bone, staining deeply with hematoxylin. Its cells can be seen in their lacunae and stain well. Here and there blood vessels penetrate this superficial layer, and small blood vessels are present through the graft.

Immediately under the superficial layer is a stratum, some of which seems living and some dead. In a general way the live bone is immediately adjacent to the haversian canals, and the dead bone fills in the spaces among the haversian systems, but this rule is only a general one. The rest of the graft consists of dense bone, whose cells stain fairly well for the most part, though they do not fill the lacunae. The marrow is normal fatty. No rarefying osteitis is present.

Fig. 3.—Albee operation. Lateral aspect of specimen, the graft on the left, with a specimen removed at *A* for study.

We have here, then, a firmly united graft after two years, composed of fairly normal bone with fatty marrow, containing blood vessels. At the surface is apparently new bone. The disease in the body of the vertebra is in the stage of healing.

Apparently it is impossible to tell with certainty dead from living bone under the microscope. In certain of the slides most of the cells are missing from the lacunae, and the bone might be pronounced dead; but if it were dead it would hardly resist absorption for two years; blood vessels probably would not be seen in its meshes, nor would ordinary fatty marrow be seen in it.

Besides these two specimens, I have been fortunate in seeing one other secondary operation, and of doing one myself. The former was done on account of the persistence of pain and discomfort, and of increase of deformity, following a Hibbs operation. The laminae in the area of disease were found fused for the most part, but a joint still persisted in one or two places in the operated area. A graft was removed from the tibia and was sewn tightly against the denuded laminae. The result is described as satisfactory.

The second case was also one in which a Hibbs operation had been attempted, and in which pain persisted and deformity increased. The spines were absent, and no indication of union was present among the laminae. The vertebrae could be seen to move

freely on one another during respiration. The treatment was by tibial grafts sewn tightly to the denuded laminae. The result ten months later was excellent. All symptoms of active disease had ceased, bony union apparently had taken place, and the marked kyphosis present previously seemed, by tracings, to have lessened.

One other fact needs mention. In a rather small experience in spinal ankylosing operations, I have lost two patients on the table. In neither was a necropsy done. A colleague has recently told me of another fatality.

Personally, I am strongly in favor of these operations in spinal tuberculosis, and regard them as curative in a formerly incurable disease; but their dangers should not be minimized. I regard my two fatalities as due to the anesthetic, and since the occurrence of the second one have never done the operation without a skilled anesthetist.

Lane Hospital.

ABSTRACT OF DISCUSSION

DR. RUSSELL A. HIBBS, New York: There is no question that we can get ankylosis of the spine by operative procedure, and I have no hesitation in saying that the earlier it is done, the better for the patient. Some have said that the patients to be operated on are those who are not doing well. Those who have had experience with Pott's disease know that it is very difficult to decide which patients are doing well over a long period, and which are not; and I do not believe that these operations are serious. I therefore think it is better to operate, and my associates have done 350 operations without any operative mortality. We have always had a good anesthetist; and, as Dr. Ely says, this is very important. Regarding the details of the operation: The success of the procedure depends primarily on the dissection. What we wish to accomplish is fusion of the bone, and not splinting of the vertebrae. We must eliminate motion. We must, therefore, eliminate the articulation, and, hence, we must fuse the bones that participate in the formation of the articulation. In the spine we have a large area of perfectly healthy bone to operate on. The posterior aspects of the vertebrae are, as a rule, healthy, and may be fused with certainty if a thorough dissection is made at operation.

DR. REGINALD H. SAYRE, New York: I have some cases under observation at the present time that show that a bone splint does not under all conditions remain, but sometimes becomes absorbed. I have three patients, two adults and one child, in whom tibial splints were placed by others. In the small boy I have had roentgenograms made each month, and have been very much interested to note the gradual disappearance of this bone splint. At first the child was purposely left without protection; but later, after six months of watchful watching, he was placed on a board. After about a year or so, he got a perfectly good spine, but no sooner than would have been the case without operation. The two adults who had been operated on before coming under my observation were unable to walk, except by supporting themselves by placing their hands on their knees; and Roentgen ray examination showed no trace of a bone splint. I have no doubt that a bone splint had been put there at some time in the past, because the scars looked as if that had been done, and because the operations were done by gentlemen of experience. I have no doubt, also, that it was a well done operation in each case, but, for some reason, the bone did not form a bridge, as in the specimen passed around by Dr. Ely. The bone had disappeared, and there was recurrence of the symptoms for which, I presume, the operation was done.

Fig. 5.—Albee operation. Photomicrograph of portion of graft, showing many empty lacunae, and a blood vessel entering the bone. Note difference in staining of bone.

DR. JAMES T. WATKINS, San Francisco: We have done between fifty and sixty of these operations at the Children's Hospital, approximately an equal number of Hibbs and Albee operations. The patients seem to get well with about an equal degree of assurance following either operation. I think that on the whole I prefer the Hibbs operation. Certainly the Albee is quicker to do. Dr. Hibbs says that in the specimen being passed around I did not fuse my articular processes. However, that is easily explained. This refinement of the operation did not appear in Dr. Hibbs' earlier publications, and I had not heard of it at the time I did this operation. Still my earlier patients got well without it. This child, you know, died of lung condition six months after operation. In this specimen most exact fusion between the adjacent spinous processes and between the adjacent laminae has taken place. There is no evidence of bony absorption. I cannot explain this apparent discrepancy. I have had occasion once to operate again on a patient who had been operated on a year previously by the Hibbs method, and I have seen the specimen which Dr. Sherman removed in another Hibbs case in the course of a laminectomy. Macroscopically the spines had been transmuted into a broad, flat, thin plate of bone more nearly resembling a sternum than anything else.

DR. EDWIN W. RYERSON, Chicago: It is undoubtedly true that we can obtain bony fusion of the vertebrae by either of these methods. The choice of the operation is not on a very well defined basis. My own impression is that if I think the patient needs a rapid operation, I can do the Albee operation a good deal faster than I can properly do the Hibbs operation. The first few of the latter operations that I did were done before I saw Dr. Hibbs do this operation; and after I had seen his careful way of doing it I knew why my first two patients did not have as good a result as I thought they should have had. I find that in younger children we must protect the spine for a longer time than I at first believed necessary.

I have seen, now, a good many of the late results of both the Hibbs and the Albee operations that I have performed. A number of the younger children on whom I did either kind have not been protected long enough, with the result that an increase in kyphosis has taken place. We should protect such patients for a long time afterward. In regard to what Dr. Sayre says of the disappearance of the Albee grafts in some of the younger patients, it is not always easy to see in the roentgenogram the shadow of the graft. I have cut down in one case in which the roentgenogram did not show the bone, only to find that there was bony ankylosis. It was slightly flexible; and the reason the boy was reoperated on was that at the top of the splinted area 3 inches above the diseased area a new focus of tuberculosis had appeared. I put in a new graft, going many vertebrae higher. The splint in the Albee operation is flexible, in children, and the patient should have protection until it is no longer so. How long this may be, I do not know. The most striking case that I have had is that of a girl on whom I operated in 1912. A large psoas abscess which she had at the operation has disappeared, and there are no symptoms whatever. You can feel a massive bone formation in the spine, from the splint, and the deformity is thought to be less than it was a few months after the operation. She had careful conservative treatment by braces for a year before operation, but the condition grew worse. She is now completely cured, four years after the operation.

Dr. J. T. Rugh, Philadelphia: One thing about this operation that has impressed me the most strongly is the very low mortality. In a series of eighty cases, I have lost but one patient. In that case, when I was through, the anesthetist could tell me every step of the operation. The patient had died on account of the ether.

Dr. R. A. Hibbs, New York: We should give these children and adults very careful protective treatment after operation. It is a great mistake to assume that you are eliminating the disease so quickly. We treat the patients just as if they had not been operated on, so far as protection is concerned. Children are treated for a year or eighteen months and adults, six months to a year. There have been many children whose parents have been disappointed because they were operated on and let go, without proper after-care. I want to protest very strongly against that.

Dr. Leonard W. Ely, San Francisco: I must differ with Dr. Watkins' contention. The section is taken approximately directly through the middle, where the base of the spinous process would be; and here there is little, if any, bony union. At the side one sees in the gross specimen the union of the laminae. When you cut off the spinous process and turn it down, probably that spinous process is doomed. Without bringing up this subject of the ultimate fate of a bone that is grafted, I would say that that spinous process may be likened to a man who is dead from some accident, but who, with artificial means of respiration is brought back to life. That life cannot be supplied to the spinous process except by contact with another bone or connection with another bone by periosteum. What Dr. Watkins says about the difficulty of the Hibbs operation I should be inclined to stand by and accentuate. Whenever I get an opportunity, I go to see the originator of the operation operate. The beauty of the dissection and the carefulness with which Dr. Hibbs does the operation seem to be the determining factors in the results obtained.

BLASTOMYCOSIS OF THE TONGUE*

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Blastomycosis is usually considered a skin lesion or a systemic disease. In a review of the literature I have been able to find only one case of blastomycosis of the tongue. Copelli[1] in 1913 reported a case of a woman who presented a tumor of the tongue consisting of an aggregation of six rounded nodules on the back part, with some enlargement of the submaxillary glands. She presented also blastomycetic lesions on both feet. Examination revealed the blastomyces in the affected tissues. The treatment used and the end-results are not stated in this case. I wish to report a case of blastomycosis of the tongue examined in the Mayo Clinic:

Fig. 1.—Blastomycetic tumor of the tongue.

J. S. M., man, aged 52, chief of fire department, came to the clinic, Feb. 7, 1916, for tumor of the tongue which had been first noticed eleven months previously. The family history was not important. Thirty-two years previously he had had a chancre which, from the history, was questionably specific. He had no secondary lesions. He smoked and chewed moderately, but had not used alcohol for thirty-one years. Sixteen months before examination at the clinic he had had tonsillitis and was treated by a physician. Eleven months before he had received an electric shock from touching an electric fixture with his right hand. On the following morning he noticed that his tongue was larger than usual. The next day he consulted a physician, who found a tumor at the base of the tongue and removed specimens for diagnosis. These specimens were reported as being "mostly lymphatic gland containing much granulation tissue; no evidence of malignancy or tuberculosis." Electric treatments for the tongue were given at this time. Nine months before coming to the clinic, he was given five treatments with neosalvarsan and eleven injections of sodium cacodylate, with no resulting change in the tumor. At this time he had much difficulty in swallowing and talking. A month later he consulted a physician who diagnosed the condition as lymphadenoma and cauterized the tumor several times with an electric needle.

* From the Mayo Clinic.
1. Copelli, M.: Jour. Cutan. Dis., 1913, **31**, 51.

This was done once a week over a period of two months. There had been shortness of breath for eight months, and also great difficulty in swallowing solids, though fluids were swallowed readily. The tumor seemed to be increasing in size, but no swellings in the neck were noted. The patient had lost 60 pounds since the onset of the trouble, and found it almost impossible to sleep at night as the tongue fell back and obstructed the pharynx, causing dyspnea. The normal weight had been 220 pounds; weight at the time of examination, 150 pounds. Speech was difficult; the voice was thick and mostly nasal in character.

Examination of the mouth showed a nodular tumor at the base of the tongue filling the entire pharynx so that the postpharyngeal wall was not visible. It was impossible to press down the tongue in order to examine the posterior part of the growth. The tumor was quite firm, but did not have the hardness of malignancy. It appeared in rounded folds between which were grayish-white areas. There were

Fig. 2.—Same as Figure 1 after condition had cleared up.

no lesions in other parts of the mouth. The systolic blood pressure was 110, diastolic blood pressure 70, pulse 96, temperature 98.6, urine negative. The white blood count was 5,400, red blood count 5,270,000. Roentgenoscopy of the chest was negative, as was also the Wassermann test. No lesions were found in any other parts of the body. The tissue removed from the tumor showed microscopically lymphoid hyperplasia with great numbers of plasma cells. Blastomycetes were found on culture from the areas in the folds of the tumor. A culture of blastomycetes injected into guinea-pigs yielded negative results.

A diagnosis of blastomycosis was made on the presence of blastomycetes with secondary lymphoid hyperplasia of the tissue of the tongue, and because all other findings were negative. Malignancy, tuberculosis and syphilis can be readily ruled out from the data stated in the history and the appearance of the tumor. The patient was given potassium iodid, 10 drops three times a day, the dose being increased by 2 drops daily until 125 drops were taken three times daily. Iodin was used locally to swab the tumor once a day, and radium, twenty-six hours of a 22 mg. tube, was given for a period of three weeks. Five weeks after this treatment the patient returned showing marked improvement in his general

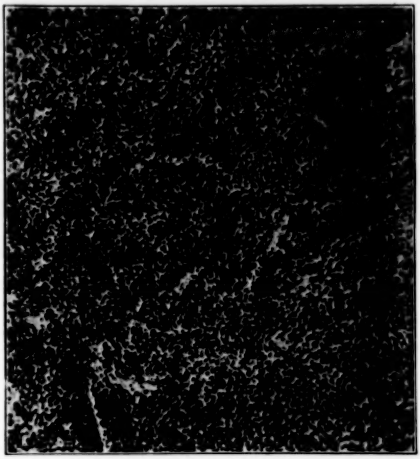

Fig. 3.—Low power: lymphoid hyperplasia.

health. He was then able to eat and swallow without difficulty, had no dyspnea on exertion, and had gained 20 pounds in weight. The tongue showed remarkable improvement, and in a direct examination of the mouth very little of

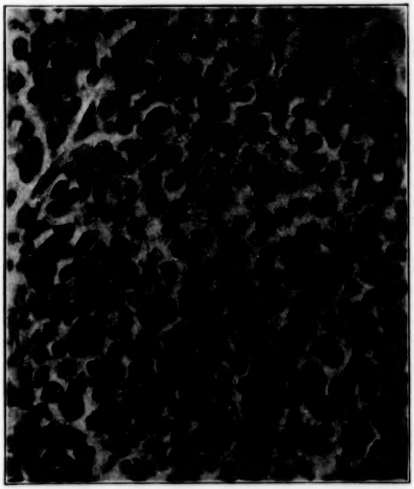

Fig. 4.—High power: great numbers of plasma cells and lymphocytes.

the tumor was visible. It was possible to see the pharynx, and by the use of the laryngeal mirror it was found that the tumor extended down the base of the tongue to the epiglottis.

Sixteen hours of a 50 mg. tube of radium were then given for a period of two weeks, the iodin again applied locally, and the potassium iodid continued. Four weeks later the patient returned feeling perfectly well, eating and sleeping without any trouble. He had gained 15 pounds since his last visit. The tongue appeared normal on direct view, and it was possible to see the pharynx readily. By the use of a laryngeal mirror a nodular tumor 1½ inches in diameter was

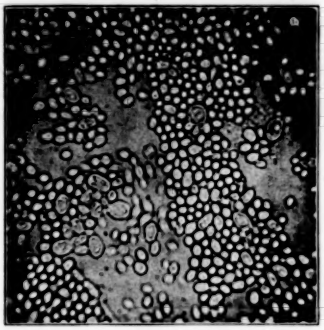

Fig. 5.—Pure culture: blastomycetes.

seen down at the base of the tongue. About it were several small nodular tumors. The larger one was removed by a snare and forceps. On microscopic examination it showed pure lymphoid hyperplasia. The smaller nodules were treated with radium, sixteen hours of a 22 mg. tube. Iodin was applied locally and the potassium iodid continued. When examined, Aug. 10, 1916, the tongue was normal. The patient had gained 16 pounds since his last visit, and was feeling well.

This case is of interest because of the rarity of blastomycetic lesion of the tongue and the remarkable results of the treatment. The nodular appearance of the tumor seemed to be the same as that reported by Copelli.[1] It must be remembered, however, that blastomycetes may be found in the tonsils and lingual tonsil so that the presence of blastomycetes alone does not necessarily mean that the disease is true blastomycosis. It would seem the lymphoid hyperplasia was a secondary condition stimulated to growth by the presence of blastomycetes, possibly in the lingual tonsil.

Malaria in the United States.—As a result of the study of malaria in the United States during the past four years, J. W. Trask of the Public Health Service (*Public Health Report*, Dec. 22, 1916) sums up the situation as follows: In the territory extending from the Gulf of Mexico to a line north of the Ohio River, and from the Atlantic seaboard to and into the eastern part of Kansas, Oklahoma and Texas, few, if any, localities are entirely free from malaria. In most of the lowlands it is very prevalent; in the mountains and better drained areas, less prevalent. The disease is also endemic in southeastern New York and parts of Connecticut, Rhode Island and Massachusetts, and in California in the Sacramento and San Joaquin valleys. There is probably no state in the Union in which the disease is not present and in which it is not spread by mosquitoes grown locally. The disease constitutes one of the big national health problems. It is also an economic problem of importance. The actual geographic distribution of the disease and its relative prevalence can be definitely determined only by making painstaking malarial surveys or by requiring cases to be reported to the health authorities and the authenticity of the reports verified by blood examinations.

A NEW OPERATIVE PROCEDURE FACILITATING THE ADAPTATION OF ARTIFICIAL DENTURES *

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Authorities on prosthetic dentistry agree that, before taking an impression, a careful and comprehensive study of the mouth from both the physiologic and the pathologic aspects should be made. In an edentulous mouth, the thickness and firmness of the soft tissues are noted, as well as stomatitis, leukoplakia and other diseased conditions, if they are present. The bony ridges are studied with regard to undue pressure which may be brought to bear on them.

If natural teeth are to be retained, they and their supporting structures must be restored to health, and in either case the attachments of muscles are noted. All of these conditions are studied in order that the denture may meet the following requirements, namely, that they may be useful, look well and be comfortable (Prothero). Primarily all of these depend on their retention which is made possible by two physical factors, adhesion, which plays the lesser rôle, and atmospheric pressure.

On account of the varying density and compressibility of the different tissues in the same mouth, both impression and model are scraped in order that a perfect adaptation of the plate to the tissues may be maintained under all the various movements and different degrees of stress to which the plate may be subjected.

While the foregoing applies to the normal mouth, the same adaptation, adhesion and atmospheric pressure apply to the abnormal mouth. To correct the abnormal mouth, surgical procedures are resorted to,

Fig. 1.—Casts of upper and lower jaws, showing their abnormal relation to each other, and marked protrusion of the upper bony arch.

namely, the removal of loose fibrous or spongy tissues, the cutting of fibrous bands, the excision of spicules of process, or well defined osteoid growths which occur in the palate, labial, lingual or buccal regions of the jaws.

* Read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

The removal of exposed, projecting process after extraction should be more frequently done than is our habit.

There is another quite common condition which can be remedied by surgical interference and which, so far as I can judge from a review of the literature and conversation with some of the leaders in dental thought, has not been pointed out, and that is the

Fig. 2.—Casts of upper and lower jaws after operation, showing normal relationship.

practical elimination of bony undercuts in the upper jaw. If this is done, the making of metal dies and the swaging of metal plates would be simplified, and the making of cores unnecessary.

A conformation which requires the slipping in of a plate as a shoe does not favor retention, but rather militates against it, as the chief factor in retention is atmospheric pressure.

When such a plate, the labial and buccal borders of which are forced into undercuts at one or more places, is subjected to the forces of mastication, the upper borders are carried away from the soft tissues, and air passes beneath the plate with its consequent release.

The study of the case here reported and the excellent result obtained by surgical means on the bony process seems to justify its more frequent performance.

The patient, a woman, aged 50, had long since lost all upper teeth posterior to the cuspids, and mastication on the remaining six anterior ones, together with some destruction of peridental membrane, had resulted in a marked protusion. Her dentist, Dr. F. H. Stafford of Chicago, extracted the remaining teeth and proposed to make an upper denture, but found it quite impossible.

He referred her to me for surgical intervention. As can be seen by the illustrations and models, there is a very marked protrusion of the alveolar process which was covered with quite normal gum tissue and mucous membrane (Figs. 1 and 3).

Two incisions along the alveolar ridge, extending from the second bicuspid region on the one side to the corresponding point on the other were made, which, being "quarter moon" shaped, eliminated the gum tissue which was between the teeth and left two cleanly cut borders of the flaps. A medium vertical incision extending from the reflection of the mucous membrane joined the other incision at right angles. The resulting flaps, together with the periosteum, were reflected.

By means of rongeur forceps and large bud shaped burrs the outer plate of bone was removed from the first bicuspid socket on the one side to the corresponding one on the other side. The thickness of bone removed varied, in the bicuspid region being the outer plate only, but the remainder extended to the posterior walls of the alveoli.

The incision along the alveolar border as well as the vertical one was closed with interrupted horsehair sutures; there was primary union within ten days. Impressions of the new normal mouth, as seen in Figures 2 and 3, were taken, and a perfectly satisfactory denture constructed.

31 North State Street.

ABSTRACT OF DISCUSSION

DR. CHALMERS J. LYONS, Ann Arbor, Mich.: This is the first operation of this kind that has been called to my attention, but I can see the good that can be accomplished in a great many of these seemingly impossible cases for the fitting of artificial dentures. Dr. Potts has practically restored this to a normal condition. This procedure should be brought to the attention of men working in prosthetic dentistry, because there is no doubt that a great number of cases come before them in which such an operation would simplify the fitting of the artificial denture.

DR. EUGENE S. TALBOT, Chicago: I have removed small pieces of the alveolar process for the same purpose, but never to the extent that Dr. Potts has removed it. In a number of cases I have also dissected up the buccinator muscle, which extended down to the border of the alveolar process, cutting it clear up to the zygomatic process, in some cases a very little, in others quite extensively, but I would like to know how to prevent the tissues from growing together again. That has been the most difficult proposition I have met, especially in cutting the frenum of the lip, to keep the parts from coming together and healing over.

DR. H. A. POTTS, Chicago: In regard to the inquiry of Dr. Talbot, I think I can best answer that by referring to the operation for widening the pylorus of the stomach, known as the Heineke-Mikulicz operation, which involves making an incision in one direction and closing it in the other. The same principle can be applied in the case of the frenum. By carefully suturing the mucous membrane together it will make the reflection continuous, consequently there will be no raw surface to oppose the raw surface at the gum, and it cannot become attached because it is covered with mucous membrane. The operation can be varied by suturing the mucous

Fig. 3.—Casts of upper jaw made from impressions taken before and after operation; the result is a perfect arch.

membrane into that area of the buccinator region. I have since seen an enormous exostosis of the labial surfaces and the tuberosities which almost filled the palate. Another interesting case has been reported of an exostosis that almost filled the palate. In such a case I see no reason why an incision could not be made from one end to the other and the bone chiseled away, if necessary, removing part of the palatal, mucous membrane and periosteum, suturing that down and making a perfectly normal mouth. As I have said, many of these things have been done, but really not with the idea of facilitating the fitting of an artificial denture, and I think by paying a little closer attention and observing these cases they can be benefited very materially.

COMPLETE FORWARD LUXATION OF CARPOMETACARPAL ARTICULATION OF THUMB

REPORT OF A CASE

E. L. BERRY
CHICAGO

The articulations between the carpus and the metacarpal bones are so constructed as to make complete luxations of these joints somewhat rare. From a surgical point of view these articulations are divided into two parts: first, the articulation of the multangulum majus (older terminology, trapezium) with the first metacarpal; second, the articulation between the inner four metacarpals and the carpus. The latter acts functionally as one continuous joint, having a synovial membrane in common. This union is of the arthroidal type, while the carpometacarpal joint of the thumb is one of reciprocal reception and is capable of motion in all direction, except axial rotation. This joint is separate from the other set, is surrounded by a strong separate capsule, and has its own synovial membrane. Although dislocations at this point are more common than at the other carpometacarpal joints, of the cases reported very few have been forward, backward luxation being by far the most common.

REPORT OF CASE

H., man, aged 30, baggage man at railway station, came to the office three hours after the injury, which occurred as a trunk which he was loading fell to the ground. The wrist was twisted, causing the dislocation. There was severe pain, and the patient had difficulty in using the hand, especially the thumb.

Displacement of os multangulum majus.

When I first saw the patient there was some swelling at the wrist and at the base of the thumb. There was considerable pain. Adduction of the thumb was difficult, painful and incomplete. The greater multangular was easily palpable on the ventral aspect, behind which the proximal end of the metacarpal formed a hard prominence beneath the thenar eminence. There was little or no shortening of the thumb. The roentgenogram shows the greater multangular displaced anteriorly and medially, with a considerable space between the proximal end of the metacarpal and the neighboring structures. There was no fracture, as often occurs, of the proximal ends of the first or second metacarpals or of the greater multangular itself.

Reduction was accomplished by the following procedure: The patient's thumb was grasped firmly in the operator's right hand, the wrist in the left, in such a manner that the tips of both of the operator's thumbs rested on the displaced bone. Then with traction on the thumb, and posterior and lateral pressure on the greater multangular, the wrist was slowly flexed. As the bone assumed its normal position there was a decided give felt by the operator, and a snapping sound that was clearly audible. The roentgenogram taken after the reduction showed the bone in its normal position. Inspection and palpation revealed no differences as compared to the other wrist, save the swelling.

A thin layer of bandage was placed round the wrist, over which was tightly wound a 3 inch strip of adhesive. The patient was able to work two weeks later, although he still wore a wrist support and the joint was somewhat weak.

1020 La Salle Street Station.

EARLY DIAGNOSIS OF TABES DORSALIS*

WALTER F. SCHALLER, M.D.
SAN FRANCISCO

Tabes dorsalis, as its name would imply, is a disease characterized by a degeneration of the posterior columns of the spinal cord. Spiller,[1] however, as far back as 1897, defined tabes in reality as a cerebrospinal disease, and indeed, certain symptoms referable to the cranial nerves may so dominate the clinical picture that the cord symptoms may be insignificant or even pass unnoticed. Prominent among these symptoms are those which are referable to the eye. Primary optic atrophy is especially frequent.

Recently, E. Frey,[2] from Schaffer's clinic, has studied 286 cases of incipient tabes, classifying these as oculo-pupillary, dysuric, lancinating and mixed forms, and studying sixty of them also from the standpoint of prognosis.

The session[3] of the Society of Neurology in Paris, Dec. 30, 1911, was devoted to a discussion of the symptomatic limitation of this affection ("Délimitation du tabes"), and the prominence of the men who took part in this discussion makes it a worthy contribution to the recent literature of this subject. J. Nageotte maintained that tabes could be defined only by terms of pathologic anatomy and by the etiology, reiterating his radicular nerve theory. Nageotte's conception was accepted by such clinicians as Babinski and André Thomas, the latter, however, not regarding the radicular lesion as pathognomonic. The question of monosymptomatic tabes was raised; and although many of those taking part in the discussion held that an isolated symptom, characteristic of tabes in a patient with a history of syphilis and presenting a typical evolution,

* From the Neurological Clinic, Leland Stanford Junior University School of Medicine.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article with the chart appears in the Transactions of the Section and in the author's reprints.

* This article and the one by Drs. Riggs and Hammes which follows it are parts of a symposium on Syphilis of the Nervous System. The remaining articles, by Drs. Ball and Pilsbury, and the discussion will appear next week.

1. Spiller, W. G.: The Pathology of Tabes Dorsalis, Int. Med. Mag., 1897, **5**, No. 5.

2. Frey, E.: Ueber klinische Formen, Symptomatologie und Verlauf der Tabes auf Grund von 850 Fällen, Ztschr. f. d. ges. Neurol. u. Psychiat., **10**, 1.

3. Rev. neurol., 1911, No. 24.

might make a diagnosis of tabes very probable, yet an absolute diagnosis was not justifiable. (Erb[4] in a recent communication elsewhere also expresses a similar opinion). Henri Dufour reported a necropsy case in which the only symptom during life was an Argyll Robertson pupil and in which the cord showed the characteristic lesions of tabes.

In answer to the question, how early one may venture to diagnose tabes, the quotation from John Babinski may not be out of order:

> A patient presents the sign of the Argyll Robertson pupil; furthermore, he is subject to lancinating pains showing the characteristics of those which occur in a plain case of tabes, and finally, notwithstanding the subjective pain, intensive faradization of the calf muscles is painless; in such a case, even in the absence of any other symptom, a diagnosis of tabes is almost sure. I can almost say as much of a patient in whom all the reflexes, including the pupillary reflex, are normal, and who presents together with the sensibility disturbance just noted a characteristic lymphocytosis of the cerebrospinal fluid. Certainly the diagnosis is not of a mathematical certainty, but of a great probability.

This statement, coming from a clinician of the prominence of Babinski, is noteworthy, and demands attention and further analysis. It is a long step from this picture to the picture presented by the classical tabetic: difficulty in walking, Romberg, ataxia, absent patellar reflexes, fixed pupils, advanced sensory disturbances and often typical complications. Syphilis is now regarded as the cause of tabes. Even Erb,[4] who has always recognized the important part which syphilis has played in this affection, has withdrawn from his former reserved position, and now states that syphilis is the sole cause outside of very exceptional and doubtful cases. How syphilis acts on the spinal cord has given rise to many theories, the toxic theory, and the meningeal theories of Obersteiner and Redlich, and of Nageotte occupying the foreground of attention. A considerable support to the toxic theory has been given by the recent experiments of Spielmeyer.[5]

In order to determine to what extent chronic leptomeningitis of the spinal cord exists in cases of tabes which have been examined at necropsy, I have collected fourteen cases, examined microscopically, from the records of the Pathological Department of Cooper Medical College and Stanford Medical School between the years 1898 and 1916. Thickening or cellular infiltration of the spinal meninges most marked in the posterior portion of the cord was present in all of these cases.

Recently, Spiller,[6] in discussing the pathology of tabetic ocular palsy, has stated that in his experience the most characteristic lesion in cerebrospinal syphilis is round cell infiltration of the pia, and that he believes that there is no acute manifestation of syphilis of the cerebrospinal axis without it. This author examined sections from eleven cases diagnosed clinically as tabes, and found in all lymphocytic infiltration of the pia, this being marked in nine cases. He quotes Bresowsky, who found this picture constant in forty cases of tabes. Schröder[7] found in all of five cases studied a pial inflammation of inflammatory nature.

I may mention here the studies of Leri[8] on optic atrophy in tabes, in which this author believes that the pathologic process is an interstitial neuritis of the optic nerve due to syphilitic meningitis and syphilitic vascular disease, and the contribution of Vincent,[9] who studied the degenerations of the third, ninth, tenth, eleventh and twelfth pairs of cranial nerves in tabes and found, in the sense of Nageotte, a transverse radicular neuritis at the place where these nerves are included in the dural and arachnoid envelopes.

I am inclined to favor the opinion that the cause of the tabetic degeneration is a radiculitis subsequent to primary syphilitic meningitis, believing that this meningitis is sufficient to explain the posterior root degeneration. Whether this meningitis affects posterior roots in the locality favored by Obersteiner and Redlich,[10] or by Nageotte,[11] although interesting from the histopathologic point of view, is of secondary practical importance: the important point to my mind is whether or not the tabetic process starts as an active inflammatory one in the meninges. The importance of a clear understanding of this question is primary, not alone on account of the great diagnostic importance of an inflammatory cerebrospinal fluid, but also from the standpoint of local intraspinal injections by specific remedies.

SYMPTOMATOLOGY

As a basis for a clinical study of the early tabes, I have selected and tabulated thirty-five cases from a total of 150 studied, 119 of these cases being similarly tabulated. Tabulated cases cannot be recorded as completely as separate case reports, but this table presents in graphic form the most prominent features of early tabes. The following discussion is limited to certain of these features; for the general symptomatology, further reference may be made to the table. This list of early tabes is manifestly too small to be of value as a statistical study as regards sex, age, occupation, nationality and the incidence of syphilis as an etiologic factor, but it may be mentioned in passing that in this list of thirty-six cases, sixteen patients denied syphilitic infection. Of this number the Wassermann was negative in the blood or cerebrospinal fluid in only six cases. In this series of six cases, only two (Cases 13 and 36) showed an absence of pupillary signs—Argyll Robertson pupils, anisocoria, and pupils of irregular contour, which we have come to regard as characteristic in syphilis.

Sensibility.—Among the complaints, some kind of pain was the most frequent. Under the headings of lancinating pains and pains described as rheumatism, we group the greatest number of these symptoms; our records show that only three cases — these all being cases of pronounced optic atrophy — gave no history of pain or paresthesias. Headache was a common symptom, being present in ten cases. Passing from the subjective complaint of pain to the objective disturbances of sensibility, we have grouped these disturbances under the headings deep and superficial sensibility. I shall not detail the results of these examinations, nor are they tabulated, reserving this study for a future communication. The frequency of objective

4. Erb: Tabes, Deutsch. Ztschr. f. Nervenh., 1913, **47**, 74.
5. Spielmeyer, W.: Experimentelle Tabes bei Hunden, München. med. Wchnschr., 1906, No. 48, p. 2338.
6. Spiller, W. G.: Pathology of Tabetic Ocular Palsy, Jour. Nerv. and Ment. Dis., 1915, **42**, 15.
7. Schröder, P.: Ein Beitrag zur Histopathologie der Tabes dorsalis, Centralbl. f. Nervenh. u. Psychiat., Neue Folge, 1906, **17**, 585.
8. Leri, André: Etude du nerf optique dans l'amaurose tabétique, Nouv. iconog. de la Salpêtrière, 1904, No. 17, p. 356.
9. Vincent, V.: Des meningites chroniques syphilitiques, Thèse de Paris, Paris, G. Steinheil, 1910.
10. Obersteiner and Redlich: Ueber Wesen der Pathogenese der tabischen Hinterstrangs Degeneration, Obersteiner Arbeiten, 1894; abstr., Neurol. Centralbl., 1894, No. 12, p. 454.
11. Nageotte, J., and Riche, A.: Tabes dorsalis, Manuel d'histologie pathologique, Cornil et Ranvier, Ed. 3, 1907.

sensibility disturbance is parallel with the severity of the disease, and these disturbances are probably a constant symptom in tabes, negative results being due to the inefficiency of our method of examination. There appears to be no constant relationship between the presence of a positive Romberg symptom and a disturbance of the deep sensibility: notion of position, passive motion, localization, deep pressure sense, discrimination between two points and the vibration test. The loss of deep pressure pain brought out in Abadie's sign and Biernacki's sign was frequently present. Occasionally in testing for Abadie's sign hyperesthesia was present.

Superficial Sensibility: The radicular disturbance of the cutaneous sensibility noted by Leyden, Marie, Dejerine, Redlich, Massary and Brissaud has been particularly studied by Marinesco,[12] and by Patrick[13] in this country with reference to tactile anesthesia about the trunk. We have also noted the sensory involvement about the trunk and especially the increased sensitiveness to cold, and the girdle sensation. Ulnar paresthesias, diminished sensibility about the genitals and the anus has also been noted in our cases. In the lower extremities, however, the radicular disturbance of the sensibility has been in our experience less evident; in this locality the charts show a picture commonly seen in polyneuritis, or that described as a segmental distribution involving the feet and shading from the distal to the proximal end of the member. Marinesco[12] previously called attention to this point. The more frequent involvement of the superficial sensibility than the deep would be the opposite of what was to be expected in an involvement of the posterior columns of the cord only, which are not tracts for pain. The symptoms of pure posterior column involvement seen best, according to Dejerine,[14] in combined sclerosis, is not the picture here. We believe the frequency and constancy of pain in tabes one of the most convincing proofs of the radicular or meningeal cause of the disease.

Reflexes.—I wish to call attention particularly to the state of the tendon reflexes in the lower extremities, the tendon reflexes in the upper extremities being generally conserved in our series contrary to the opinion held by Frankel. Preservation of the patellar tendon reflex and the Achilles tendon reflex is compatible with a diagnosis of tabes: in thirteen of our cases such a condition was present. The loss of the patellar tendon reflex or Westphal sign is properly considered an important and characteristic symptom of tabes. I wish particularly to discuss the state of the Achilles tendon reflex in these early cases. Babinski[15] (1901) deserves the credit of calling attention to the early loss of this reflex, which he claimed generally disappeared before the patellar tendon reflex. During the period 1898-1901 this author observed forty cases of this nature, as opposed to five cases in which the patellar tendon reflex was absent and the Achilles tendon reflex present. Prior to Babinski's publication, Goldflam[16] noted the absence of this reflex in cases of tabes, and Ziehen[17] discussed its diagnostic signification in various psychoses and psychoneuroses. Following Babinski's first communication in 1898, C. K. Mills[18] found this reflex present in only three cases of tabes out of twenty-eight cases, in all of which the patellar tendon reflex was present. Van Gehuchten,[19] Biro[20] and Tumpowski[21] arrived at similar results. Kollartis[22] found eleven cases in 100 in which the Achilles tendon reflex was lost and the patellar tendon reflex conserved; and in only one case was the opposite the case: Achilles tendon reflex present, patellar tendon reflex absent (unilaterally). Sarbo,[23] in ninety-two cases, found 91 per cent. missing Achilles tendon reflexes, and in 190 cases 80.4 per cent. missing patellar tendon reflexes. In seven cases the Achilles tendon reflex was lost, the patellar tendon reflex conserved. Förster[24] and Strassburger[25] noted the absence of this reflex in tabes, without, however, calling attention to its relative importance. Bregman[26] draws an analogy between the loss of this reflex and cutaneous sensibility disturbances in the area supplied by the fifth lumbar and first sacral roots. Oppenheim[27] sounds a warning note against attaching too great importance to the absence of this reflex in the diagnosis of tabes, because of its frequency in sciatica and related peripheral nerve conditions. Jelliffe and White[28] state that the Achilles tendon reflex is not infrequently lost before the patellar tendon reflex.

The technic of eliciting this reflex is important, the kneeling position with the foot hanging free and relaxed being necessary for a proper performance of the test (Babinski). In our series there were twenty cases in which one or both of the Achilles tendon reflexes were absent with conserved patellar tendon reflexes, and in seven of these, the Achilles tendon reflex was absent on one side only. A striking relationship in regard to the absence of this reflex was seen in ten cases of primary optic atrophy, the extremities of the cerebrospinal axis, as it were, being affected by the tabetic process. It would then appear that the loss of the tendon reflexes in the lower extremities in tabes takes the form of a regular progression from below upward in the majority of cases, and in this regard Cases 33 and 36 seem to show both Achilles tendon reflexes lost before the patellar tendon reflex, the latter reflex being lost first on one side only. Further, in reviewing the total number of cases (150) we have encountered only one instance in which the patellar tendon reflex was absent when both Achilles tendon reflexes were conserved, and in this one instance only one patellar tendon reflex was lost. From these data, then, we believe that as a rule the loss of the Achilles tendon reflex precedes the loss of the patellar tendon

12. Marinesco, G.: De la topographie des troubles sensitives dans le tabes; ses rapports avec les sensations des tabétiques, Semaine méd., 1897, No. 47, p. 369.
13. Patrick, H. T.: Anesthesia of the Trunk in Locomotor Ataxia, New York Med. Jour., Feb. 6, 1897, p. 173.
14. Dejerine, J.: Le syndrome des fibres radiculaire longues des cordons postérieurs, Presse méd., 1913, No. 104, p. 1053.
15. Babinski, J.: Sur le tendon d'achille dans le tabes, Société médicale des hôpitaux, seance du 21. Oct., 1898. Société de neurologie de Paris, Séance du 2, Mai, 1901; abstr., Rev. neurol., 1901, **9**, 482.
16. Goldflam, S.: Ueber die Ungleichheit der Knie Phänomene bei Tabes dorsalis, Neurol. Centralbl., 1888, pp. 529, 556.
17. Ziehen, T.: Zur diagnostischen Bedeutung des Achilles-Sehnenphänomens, Deutsch. med. Wchnschr., 1894, No. 34, p. 670.
18. Mills, C. K.: Some Points of Special Interest in the Study of the Deep Reflexes in the Lower Extremities, Jour. Nerv. and Ment. Dis., 1899, **26**, No. 3.
19. Van Gehuchten, quoted by Babinski: Footnote 15.
20. Biro, M.: Ueber Störungen des Achillesschnen Reflexes bei Tabes und Ischias, Deutsch. Ztschr. f. Nervenh., **10**, 188.
21. Tumpowski, A.: Beitrag zur Aetiologie und Symptomatologie der Tabes dorsalis, Deutsch. Ztschr. f. Nervenh., 1897, p. 467.
22. Kollartis: Das Verhalten einiger Reflexe bei Gesunden und bei Tabes, Deutsch. Ztschr. f. Nervenh., 1902, No. 23, p. 89.
23. Sarbo, A. von: Klinische und statische Daten zur Symptomatologie der Tabes, Deutsch. Ztschr. f. Nervenh., 1902, No. 23.
24. Förster, O.: Zur Symptomatologie der Tabes dorsalis, Monatschr. f. Psychiat. u. Neurol., **8**, 1.
25. Strassburger, J.: Ueber das Fehlen des achillesschnen Reflexes und seine diagnostische Bedeutung, Deutsch. Ztschr. f. Nervenh., **17**, 315.
26. Bregman, L.: Sehnenreflexe und Sensibilitätsstörung bei Tabes dorsalis, Neurol. Centralbl., 1905, No. 1, p. 2.
27. Oppenheim, H.: Lehrbuch der Nervenkrankheiten, 1913, Berlin, Karger.
28. Jelliffe and White: Diseases of the Nervous System, 1915.

reflex, and is therefore an earlier and more important diagnostic sign. It is possible in the cervical type of tabes that a different order may ensue, but such an example has not yet come under our observation.

In our cases we note bladder disturbance in ten cases, a very important early sign of cord involvement; also gastric crises in ten cases. The frequency of general glandular enlargement including epitrochlear enlargement (eleven cases), and cardiovascular disease is called attention to because they are important symptoms of syphilis and not of tabes. In fifteen cases psychic or neurotic disturbances were noted.

Eye Symptoms.—The frequency of eye symptoms in tabes has long been recognized, and among these, primary optic atrophy is probably the most frequent. The remarkable statistics of von Grosz[29] show 88 per cent. of diseased papillae in 100 cases examined, and in only two out of the twelve normal backgrounds were present normal vision, normal fields and normal color perception. In thirteen of our tabulated cases primary optic atrophy was found, being quite advanced in a number of these cases. From the study of these we were able to pick out many of the early forms of tabes enumerated here. Argyll Robertson pupils and those showing definite sluggish reaction to light were present in twenty-four out of twenty-five cases; and anisocoria and pupils of irregular contour were found, respectively, in fifteen and thirteen cases, which establishes these two conditions as of great importance as characteristic tabetic eye signs possibly antedating the Argyll Robertson pupil.

Ear Symptoms.—There were sixteen cases of diminished hearing, nine of these in association with optic atrophy. The absence of special examinations in all cases to determine the character of the deafness, whether a nerve deafness or of peripheral origin, is of course not conclusive; but recent observers, such as Knick and Zalozieckí[30] and Swift,[31] who called attention to syphilitic meningitis as the cause of diminution of hearing in certain cases of early syphilis, is important in suspecting a large percentage of our cases to be due to nerve deafness, consequent on radicular nerve disease. The fact that syphilitic disease of peripheral nerves is a very rare disease would support this view.

Trauma.—In eleven cases a history of trauma was obtained. The question of trauma as an exciting cause or a contributory cause in tabes in relation to disability has come up in industrial accident cases in California. An analysis of these eleven cases shows four patients (Cases 1, 10, 24 and 31) were injured before syphilitic infection took place. In two other cases (Cases 16 and 26) of failing eyesight and optic atrophy, trauma preceded the failing eyesight by so short a time that its rôle in the development of the optic atrophy was very questionable.

Wassermann Reaction and Cerebrospinal Fluid Analysis.—The Wassermann reaction was found positive in twenty cases in the blood and in twenty cases in the cerebrospinal fluid, and in one or both in twenty-seven cases. The globulin reaction was present in twenty-two cases out of the thirty-one done. The cell count was positive in twenty-seven out of thirty-two cases and was the most frequent positive cerebrospinal fluid reaction in our series. In five cases the cell count was not increased, three cells being regarded as the upper limit of normal per cubic millimeter. In a recent paper[32] on the subject of cerebrospinal fluid analysis in which 116 fluids were examined, it was my opinion that six cells per cubic millimeter were the upper limit of normal, but we have come to regard this figure as too high. The lower figure corresponds with the results of Nageotte, who found an average of three cells per cubic millimeter in fifty-six normal fluids examined. I myself prefer the Nageotte[33] counting cell, and count at least six cubic millimeters of fluid, making two separate spreads and being careful to obtain a good admixture of fluid and to count the fluid a short time after it is withdrawn. It is exceedingly likely that variation in results is often due to a failure in technic. In three cases the cells and globulin were not increased, and in two cases all reactions of the cerebrospinal fluid, including the Wassermann test, were negative. Nonne[34] reports eleven such cases in 167 cases of tabes. In Case 13 we have a record of an entirely negative cerebrospinal fluid with definitely thickened membranes.

This brings us to the consideration of the importance and constancy of the cerebrospinal fluid reactions indicating inflammation: increased cell count and increased globulin content and probably also the Lange gold test. Since Widal, Sicard and Ravaut[35] found an increased cell content in cases of paresis and tabes, and Guillian and Parant[36] noted an increased globulin content, these tests have occupied first rank as important diagnostic aids in detecting syphilis of the central nervous system. In the Paris meeting noted above it was the opinion of Sicard that a lymphocytosis was constant in tabes as a rule. Soques had found it absent one or two times in tabes. André Leri considered the lymphocytosis as indicating a meningeal process in evolution, and reported on the examination of a spinal cord in which at different levels the histologic picture varied; in the cervical region thickened membranes and infiltration of leukocytes, whereas the dorsal cord showed definite thickened meninges without infiltration of leukocytes.

This brings us to the important point of correlating our findings in the cerebrospinal fluid with our conception of the histopathology of tabes dorsalis. We have seen in our list of necropsies that a chronic syphilitic leptomeningitis, most intense in the posterior aspect of the cord, is a constant finding. It would be only natural to assume that such an inflammation in the meninges would manifest itself in increase of cells and globulin in the cerebrospinal fluid. I believe that repeated lumbar puncture will show at one time or another increased cell count and albumin in a progressive tabes, and that in a negative outcome of such repeated tests the diagnosis of tabes should always be made with reserve. It may not be amiss to report a case[37] previously but erroneously reported as tabes,

29. Von Grosz, quoted by Karl Schaffer: Handbuch der Neurologie, Lewandowsky, Spezielle Neurologie, 959.
30. Knick, H., and Zalozieckí, A.: Ueber Acusticuserkrankungen in Frühstadium der Lues, Berl. klin. Wchnschr., 1912, **49**, Nos. 14, 15.
31. Ellis, A. W. M., and Swift, H. F.: Involvement of the Eighth Nerve in Syphilis of the Central Nervous System, THE JOURNAL A. M. A., May 1, 1915, p. 1471.
32. Schaller, W. F.: A Report on the Analysis of the Cerebrospinal Fluid, Jour. Nerv. and Ment. Dis., 1913, **40**, No. 8.
33. Nageotte and Levy, Valensi: Numeration direct des élements cellulaires du liquid cephalorachidien, Compt. rend. Soc. de biol., 1907, **2**, 603.
34. Nonne: Der heutige Standpunkt der Lehre von der Bedeutung der vier Reaktionen, Deutsch. Ztschr. f. Nervenh., 1911, **43**, 201.
35. Widal, Sicard and Ravaut: Cytologie du liquide cephalo-rachidien au cours de quelques processus méningés chroniques (paralysie générale et tabes) Bull. et mém. Soc. méd. d. hôp. de Paris, Jan. 18, 1901, p. 31.
36. Guillian and Parant: Sur la présence d'albumines coagulables par la chaleur dans les liquid cephalo-rachidien des paralytiques spinaux, Rev. neurol., April 30, 1903, p. 406.
37. Schaller, W. F.: Salvarsan in Syphilitic Disease of the Nervous System, California State Jour. Med., October, 1912, Case 10 (Tabes).

which presented certain characteristic symptoms of tabes: gastric crises, ataxia, sensory disturbances and absent Achilles tendon reflexes and patellar tendon reflexes. Repeated examinations of the cerebrospinal fluid were constantly negative as regards cell count and globulin, but finally a faintly positive Wassermann reaction in the cerebrospinal fluid was obtained. Syphilis was denied. This patient subsequently died of an intercurrent affection, and necropsy revealed posterior column degeneration on cut sections of the cord which led to the diagnosis of tabes dorsalis; but the meninges were not thickened or infiltrated. This feature was commented on, and this was considered a case worthy to report, but Weigert's stain for myelin degeneration showed the typical picture of a combined sclerosis. I am not aware of any case of tabes being yet reported which has shown clinically a negative cerebrospinal fluid finding for cells or globulin, and in which a following postmortem examination has revealed normal spinal meninges by microscopic examination.

CONCLUSIONS

1. In tabes the syphilitic posterior leptomeningitis of the spinal cord (and probably also of the radicular nerve) is in etiologic relationship to the degeneration of the posterior columns of the cord. Every case of syphilitic posterior leptomeningitis and consequent multiple symmetrical radiculitis is a case of potential tabes.

2. This meningeal reaction is evidenced in the cerebrospinal fluid by an increased cell count and increased globulin content; and probably also by a positive Wassermann reaction indicating that this reaction is syphilitic in nature. During certain stages in the evolution of tabes, probably of repair, these reactions may be negative. It is therefore necessary to make repeated lumbar puncture in doubtful cases.

3. Syphilitic radiculitis has its characteristic disturbance of the sensibility: Subjective disturbances are pain and paresthesias; objective disturbances are deep and superficial sensibility impairment, the latter following radicular distribution. In the lower extremities, this radicular involvement cannot always be demonstrated, the sensory cutaneous involvement often presenting a peripheral or segmental type.

4. The Achilles tendon reflexes are lost as a rule before the patellar tendon reflexes: this phenomenon was observed in ten cases of primary optic atrophy from a total of thirteen cases.

5. Anisocoria and pupils of definitely irregular contour are found frequently in early tabes. These pupillary signs, even in the absence of the Argyll Robertson pupil, are highly characteristic of early tabes, provided there is no local assignable cause.

6. The symptom of diminished hearing is frequently encountered in early tabes.

7. Cardiovascular disease, especially aortic disease, and general glandular enlargement are frequently found in tabes, thus giving evidence of syphilitic processes elsewhere in the body.

8. In a patient with a history or other evidence of syphilis presenting characteristic sensibility disturbances of the radicular type with a tendency to symmetry, one should suspect a potential or early tabes. If, associated with the foregoing, we have a positive reaction in the cerebrospinal fluid indicating a chronic syphilitic meningitis, together with such pupillary phenomena as anisocoria, pupillary irregularity or sluggish reaction to light, the diagnosis of early tabes is most probable. Added to the foregoing symptoms, the loss of the Achilles tendon reflex establishes the diagnosis of early tabes even in the absence of those signs which we usually associate with tabes: Romberg, marked sensibility loss, absent patellar reflexes and Argyll Robertson pupils.

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SHALL WE TREAT THE PARETIC?*

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The first clear presentation of the clinical relationship of the mental and physical symptoms in paresis was made by Bayle in 1822, although the earliest description of this disease was given toward the close of the eighteenth century by Chiarugi and Haslam.[1] Almost forty years ago, Fournier startled and antagonized the medical world by suggesting that syphilis in the great majority of cases was the cause of locomotor ataxia. This has been a subject of bitter discussion for more than a third of a century; in fact it was Metchnikoff's infection of apes with syphilis in 1903 that robbed syphilis of its mystery, and gave it a definite standing among infectious diseases. This was the first definite step in the elucidation of our present knowledge of the pathology and symptomatology of nervous syphilis. Then came notable years. Schaudinn in 1905 discovered the *Spirochaeta pallida*. In 1906, Wassermann announced his reaction, which proved the presence of syphilis in the varied manifestations of syphilis. The researches of Noguchi, Moore, Marie and Levaditi, who have found spirochetes in the lesions of tabes and paresis, demonstrated that in these affections, we are dealing with actual syphilis: a late manifestation of the infection. It has been recently suggested that we discard the terms "paresis" and "tabes," and speak only of cerebrospinal syphilis, paretic or tabetic in type. The yearly economic loss to New York State on account of insanity is about $35,000,000. Syphilis was the principal cause of insanity in 19.8 per cent. of the male and in 7.2 per cent. of the female patients admitted to New York State hospitals in 1913. "Of the killing diseases," says Sir William Osler, "syphilis comes third or fourth." Church states that it is a conservative estimate that one man in every five is syphilitic. In the New York State hospitals, paresis constitutes one eighth of all the admission. Out of 4,000 syphilized men examined, twenty-two years after the last of them was infected, Mattauschek and Pilcz[2] found that 6.27 per cent. had developed paresis or tabes or both of these diseases. It has been estimated that from 9 to 25 per cent. of those infected develop nervous symptoms. At the San Francisco session of this Association, we placed great emphasis on the importance of the examination of the spinal fluids in early syphilis. Hoffman, Nicols and Steiner have observed that in 15 per cent. of the cases

* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Chiarugi and Haslam, quoted by Kraepelin: General Paresis, Nervous and Mental Diseases, Monograph Series, No. 14, 1913.

2. Mattauschek and Pilcz: Ueber die weiteren Schicksale 4,134 katammestische verfolgte Falle luetische Infektion, Med. Klin., 1913, p. 1544.

in primary and secondary syphilis, the spinal fluids are infectious, and infections by their inoculation can be obtained before changes can be observed in the Wassermann and other reactions.[2] After a syphilitic infection, it would appear that there is invariably an involvement of the central nervous system, even though it be of slight duration and unattended by neural change. That a variation in the spirochete occurs is shown by laboratory experiments. Wile[4] observed that spirochetes injected into rabbits from the living paretic brain were of a virulent type, and that the incubation was shorter than with other strains. Investigators in the laboratory of the Army Medical School in Washington have bred several varieties of spirochetes. "They can breed a variety which will produce a hard chancre, or a variety which will produce a chancre lacking the old hunterian characteristics of a saucer-like indurated base. They can produce a spirochete which will give a mucocutaneous efflorescence, or a spirochete which will be poor in cutaneous manifestations, with a tendency to confine its influence to the nervous system" (Church).

During the past decade, our conception of syphilis and its therapy has been absolutely revolutionized. The latter was based largely on hypothesis and empiricism. Twenty-seven years ago, we were taught that the essential and primitive anomaly in the paretic's brain was "a vasomotor disturbance."[5] Trephining was therefore suggested by Batty Tuke of Edinburgh, to overcome cerebral congestion and we (Dr. Riggs) can well recall the enthusiasm with which he discussed the potentialities of the new procedure. This was the first step in the subdural medication of today. In 1901, Dr. Ford Robertson,[6] suggested that paresis was a disease due directly to the toxins of bacteria, the point of attack being the alimentary tract. In 1903, he first announced his theory of *Bacillus paralyticans* as a cause of dementia paralytica.[7] In 1905, Robertson and McRae[8] reported the presence of the diphtheroid bacilli in the genito-urinary tract in general paralysis and tabes dorsalis. The same authors,[9] in 1907, discussed the treatment of paresis and tabes by vaccines and antiserum. While they first tried vaccines, they placed their reliance on the antiserum. The latter was obtained from immunized sheep which had been inoculated with dead cultures of the *Bacillus paralyticans-longus*, isolated from the brain of a general paralytic. After two months' treatment of the sheep, the serum was fit for use. It was administered by mouth, nose or hypodermic. Of twelve cases of paresis treated by them, they report that "all have shown remarkable signs of improvement." In tabes the ataxia was much benefited.

The favorable influence of an intercurrent acute febrile disease in certain cases of general paralysis has long been a matter of common observation. Since it would be neither judicious nor wise to infect the patients with a serious specific fever, other means for inducing a harmless temporary febrile reaction have been suggested. The tuberculin treatment of von Wagner[10] and the sodium nucleinate injections of Donath are the two classical methods of inducing artificial pyrexia in this disease. In 1909, von Wagner announced his treatment of general paralysis by injections of tuberculin (Koch) combined with mercurials and iodids. His pupil, Pilcz, in 1910-1911, reported eighty-six cases of clinically demonstrated paresis which were treated by this method. Small doses, from 0.0005 to 0.01 c.c. of tuberculin, were injected every second day, the dose being gradually increased until 0.3 or 0.5 or even 1 c.c. was administered. In 39.44 per cent. there was no perceptible or only a slight improvement, while in 60.32 per cent. there was a distinct clinical betterment observed. Remissions were noted in 26 per cent. of the cases. In 1903, Donath[11] reported six cases of paresis and of cerebral syphilis treated by salt infusion, given every third or fifth day. The infusion was administered for the purpose of freeing the system of toxins formed by the degenerating nervous substances. All these patients were improved by the treatment, and he believed the subcutaneous injections of salt solution of particular value in early paresis. In 1910, he suggested the use of sodium nucleinate in place of the salt infusion.[12] He injected 1 gm. of this salt (a 2 per cent. solution in normal saline) once a week. There is a rise of temperature, which attains its maximum in from four to ten hours and returns to the normal in from one to two days; a transient leukocytosis numbering from 10,000 to 25,000 per cubic millimeter occurs, which disappears generally by the fifth day. He reported the treatment of fifteen patients with paresis; 60 per cent. showed improvement in tremor and memory and a lessening of acute mental symptoms; three were able to return to work; six were improved; in five there was no change; one died of apoplexy. Mercury was also used.

Last fall, we (Dr. Riggs) wrote twenty-six of our leading neurologists and alienists in regard to their experience with the pyrexia treatment in paresis. None had used tuberculin; two, Dr. Dana and Dr. Barrett, had tried the sodium nucleinate injections. The former stated that he had used the nucleates of soda in several cases of paresis. He had not seen it do any good and had not heard of any good results. The latter wrote: "We did a little work with the nuclein treatment of Donath, but our work was not carried very far. I felt that with such methods as these we could not get at the real root of conditions present in paresis." In Dr. Church's reply, he said: "Many years ago (twenty-five years) some such cases were treated with inoculations of modified erysipelas germs, or what amounted to that, in the hospital at Elgin, only, however, with unfortunate results." Regarding this method, Dr. Purves Stewart says: "I have made a number of observations with a moderate amount of encouragement." Dr. C. W. Burr questions the beneficial influence of an acute febrile attack in these patients. "I have seen a few patients, who, during a febrile attack, seemed to temporarily improve. My impression is that the cause of the fever was of no importance. I have never seen

3. Church, Archibald: Some Modern Views of Syphilis of the Nervous System, THE JOURNAL A. M. A., May 20, 1916, p. 1596.
4. Wile U. J.: Experimental Syphilis in the Rabbit Produced by the Brain Substance of the Living Paretic, Jour. Exper. Med., 1916, **23**, 199.
5. Spitzka, E. C.: Manual of Insanity, 1889.
6. Robertson, Ford: Brit. Med. Jour., 1901.
7. Robertson, F. W.: Histologic Evidences of the Presence of an Organism Resembling the Klebs-Loeffler Bacillus in Cases of General Paralysis of the Insane, Rev. Neurol. and Psychiat., 1903.
8. Robertson, F. W., and McRae, G. D.: Observations on the Treatment of General Paresis and Tabes Dorsalis by Vaccines and Anti-Sera, Rev. Neurol. and Psychiat., 1907, **5**, 673.
9. Robertson, F. W., and McRae, G. D.: Rev. Neurol. and Psychiat., 1907.
10. Von Wagner: Ueber die Behandlung der progressiven Paralyse, Wien. med. Wchnschr., 1909, No. 27; International Medical Congress, Budapest.
11. Donath, Julius: Die Behandlung der progressiven Paralyse sowie toxischer und infektiöser Psychosen mit Salz Infusion, Deutsch. med. Wchnschr., 1903, **29**, 110.
12. Donath, Julius: Weitere Ergebnisse der Behandlung der progressiven Paralyse mit Natrium nucleinum, Berl. klin. Wchnschr., Dec. 19, 1910.

any permanent good result. I have seen many other patients with paresis in whom fever had no influence at all."

In 1905, Dr. Myer[13] said, "The important point about general paresis seems to be finding out what makes general paresis a progressive disease." Modern research answered that question. The important problem now is how to destroy the spirochete. The potentiality of our therapeutic resources has been greatly enhanced by Ehrlich's discovery of salvarsan in 1909. It is the consensus of opinion that all the varied manifestations of syphilis can best be treated by the combined use of mercury and salvarsan. Since these patients first consult the general practitioner, on him rests a grave responsibility, for only by an early recognition of the initial lesion and a radical use of modern methods of therapy can a cure be obtained, or late syphilis (paresis or tabes) be prevented. After invasion of the nervous system, one of two modes of procedure may be advised: intrathecal or intensive medication. To Marinesco, in 1911, belongs the credit of the initiation of the former. Swift and Ellis used salvarsanized serum intraspinally in the therapy of tabes dorsalis in 1912, while Robertson of Edinburgh employed it in paresis in 1913. In 1914, Ravaut injected neosalvarsan directly into the spinal fluid. Byrnes during this year used intraspinal injections of mercurialized serum. In 1915, Hammond and Sharpe treated three paretic patients by direct injection, into the lateral ventricles, of salvarsanized serum and neosalvarsan added to the serum.

This multiplicity of procedure is not chaotic, as it would at first appear, it is an expression of the scientific purpose to reach the hitherto inaccessible spirochetes, to bring the spirocheticidal solution into contact with the infecting organism; it is simply science groping, if somewhat blindly, for a definite result. "The end in view in this treatment of nervous syphilis," says Swift, "is threefold, i. e., cure, amelioration or prolongation of life." Have modern methods, as employed in paresis, been of value in any of these respects? Certainly not in cure in fully developed types of the disease. Do they arrest or favorably influence paresis or prolong life? Many believe that as good results were obtained from the routine treatment of the presalvarsan period. Others regard modern methods as most disappointing. Evans and Thorne[14] state that as much improvement may be seen in patients who have received no special treatment as they observed in their cases following the combined use of the intraspinal and intracranial methods. Such, however, has not been our observation or experience.

We believe that, by intraspinal medication, remissions are greatly increased in frequency; that in early paresis, marked improvement may occur, with a possible arrest of symptoms. Paine[15] has observed 1,279 untreated cases in which there occurred ninety-five remissions. Statistics vary greatly as to their occurrence, varying anywhere from 4 to 20 per cent. Cotton has observed as the result of treatment 35.5 per cent. of remissions, while in the untreated cases, the number of spontaneous remissions was about 4 per cent. Ogilvie[16] has reported twenty-six remissions, averaging over a year each, out of thirty-five cases. The minimum number of injections required to induce a remission was six; the maximum, fourteen. "The establishment of a remission," says this writer, "is something gained, but it is merely one step in the right direction." The favorable results of this treatment, according to Amsden, can best be expressed in terms of remission. "The value of remissions in general paresis in any line of treatment is difficult to estimate," says Barrett. "We have, however, gained the impression from a considerable amount of work, that remissions are more complete and patients are able to remain out of the institutions longer when treated intraspinally than by any other mode we have used."

Regarding the arrest of the paretic process, Marinesco and Minea[17] say:

> Modern therapeutics cannot accept the dogma of the incurability of general paresis, not even of its steady progress; there are cases known where the disease is stationary; such are rare. There are many cases in which repeated remissions occur. The stationary state, as well as the repeated remissions, prove not only that the lesions can stop for some time, but also that there must be in the brain of general paralytics alterations which can be replaced.

These writers suggest that remissions are due to the formation of antibodies as in other infectious diseases.

We have had the opportunity of observing seventy-one cases of paresis during the past four years, of which twenty-one have been treated by us. Of the fifty untreated cases, or those treated intravenously or with mercury, one only has had a remission. The brief citation of four cases will be sufficient.

Case 1.—Man. The grandiose type, with characteristic spinal blood and fluid findings of paresis. A remission of four months' duration occurred after the sixth treatment. A relapse occurred and after further treatment there was a second remission of five months' duration, which still persists. He is steadily improving and is practically normal, aside from occasional periods of mild elation. This patient has had forty-one intraspinal injections (thirty-four salvarsanized serum; seven mercurialized serum) with no untoward symptoms. The spinal fluid gives a positive Wassermann in 0.8 c.c.; there is a trace of globulin; no lymphocytosis; blood Wassermann negative; no change in the colloidal gold reaction.

Case 2.—Man, aged 44; family and personal history negative; aside from alcoholism. Acute grandiose type; patient showed mental unbalance a year before coming to us. Biologic findings typically those of paresis; remission took place after the seventh injection, which lasted for eight months. He was able to resume the oversight of his business affairs. He then became homicidal and suicidal and was sent to the state hospital. Aside from the suicidal propensity, his mental condition seems good. He received twenty-one injections of salvarsanized serum (Swift and Ellis); blood Wassermann negative; spinal fluid negative in 0.8 c.c.; positive in 1 c.c.; no globulin; no lymphocytosis; colloidal gold curve uninfluenced.

Case 3.—Man, aged 48; single; gonorrhea in 1900; denied syphilis; when seen by us he was acutely excited; it required four men to bring him to the hospital. Since January, 1915, patient has been indifferent about his work and restless. He became elated in March, 1915. There were Argyll Robertson pupils and increased knee jerks. Serobiologic findings those of paresis. After the sixth injection of salvarsanized serum, he was able to return home and help on the farm. At present writing, aside from slight nervousness, he is apparently normal. He received in all twenty-six intraspinal treatments (Swift and Ellis). After a time, we gave him weekly, in

13. Myer, Adolph, discussion, Dana, Charles L.: The Curability of Early Paresis, The Journal, A. M. A., May 6, 1905, p. 1413.
14. Evans, B. D., and Thorne, F. H.: The Treatment of Paresis, Am. Med.-Psychol. Assn., 1915, **22**.
15. Paine, L. H.: Boston Med. and Surg. Jour., 1913, **148**, 648.
16. Ogilvie, H. S.: New York Neurological Society, Jour. Nerv. and Ment. Dis., March, 1916.
17. Marinesco and Minea: L'emploi des injections de serum salvarsanisé "in vitro" et "in vivo" sous l'arachnoid spinale et cérébrale dans le tabes et la paralysie générale, Rev. Neurol., 1914, **27**, 337.

addition, 2 grains of mercuric salicylate intramuscularly. Blood serum is negative; spinal fluid positive in 0.8 c.c.; no lymphocytosis; no globulin; colloidal gold curve unchanged.

CASE 4.—Man, aged 38, contracted syphilis in 1902; consulted us, March, 1916; was talkative, disoriented, very restless, expectorated constantly and made grimaces; Argyll Robertson pupil, increased knee jerks and Babinski. Biologic findings those of paresis; was given mercurialized serum intraspinally with intramuscular injections of mercury. He grew gradually worse and died, April, 1916. No biologic reduction. Evidently this was a case of so-called "galloping paresis."

Of the twenty-one patients treated with salvarsanized serum intraspinally (Swift and Ellis) with and without mercury intramuscularly, ten showed a decided improvement. Of these, five are at present attending to their business affairs; one had a remission of eight months; another one of four months; one has had two remissions of four and five months' duration, respectively; one is at home. In this patient, there is a slight improvement with an occasional epileptic attack. Still another is home and is able practically to attend to his business. Three died, not following an injection, but some time after discontinuing treatment. The eight remaining are still living and have manifested some improvement physically, but no change in the mental condition. In all but two of these patients who were sufficiently treated, the Wassermann in the blood became negative, but none gave a negative Wassermann in the spinal fluid; lymphocytosis disappeared; globulin a trace. We have been unfortunate that in none of our cases have we been able to render the spinal fluid negative. According to Ogilvie, it is practically impossible to get a negative Wassermann in true parenchymatous disease of the brain. When obtained, it indicates that the specific process is confined largely to the interstices of the cerebral tissues.

"At this hospital, we have treated, in all," says Dr. Blumer,[18] "twenty-five cases, twenty paretics and five tabetics (December, 1915). Of the paretics, five are now dead, four having shown no improvement; one died of a convulsion after having shown considerable improvement. In five other cases, the course of the disease continues unabated. The remaining ten have all shown great clinical improvement and have been able to return to their homes and business. Of these, three men have had no recurrence during nearly two years' absence from the hospital. The laboratory results have been rather discouraging. Only four patients have obtained a persistently negative Wassermann. Most of the others show no change, while in some the Wassermann has appeared and disappeared irregularly. Three show disappearance of the gold chlorid reaction, while the remainder show practically no change. In all cases the cell count has shown a steady reduction; the globulin content has been more varied, but in most cases has fallen to normal with the improvement of the patient." "We have a number of cases of paresis," writes Barrett, "who were treated intraspinally, in which the diagnosis was unquestionable, who are now carrying on their accustomed occupations with remarkable efficiency, considering their disease."

Amsden[19] states that "intraspinal treatment with salvarsanized serum has in a considerable number of cases a positive influence in checking the progress of the disease, at least clinically; it does not stop it except in very rare cases." The writer also calls attention to the fact that from the standpoint of the family, the value of this treatment is a matter of importance, since the patient may become able to give information about his affairs, enabling him, as it were, to put his house in order. "In the use of salvarsanized serum," Cotton says, "we have an agent which does cause definite arrest in paresis, which arrest includes improvement in the clinical symptoms, physical signs and a corresponding change in the biological reactions from positive to negative." The writer points out that as it is necessary to treat tuberculosis in the incipient stage in order to obtain results, that it was equally true in regard to paresis, it was fallacious to condemn the treatment of paresis because we could not cure the end stage. He says:

> The emphasis should be placed on treating the cases early. This is especially so in regard to state hospital work, where 75 per cent. of the cases are admitted too late for treatment to be of any benefit to them, but 25 per cent. can be materially improved, as shown by our records. The mortality from paresis has dropped 33⅓ per cent. in the hospital in the last three years. We also have no bedridden paretics, which as a rule are the bane of most hospitals. If these results can be produced on fairly well advanced cases, it augurs well for the success of the treatment of early cases.

The time, then, of greatest opportunity in the treatment of paresis is in its incipiency, before the parenchyma of the cortex has become the seat of degenerative change. "It would be unfortunate," says Amsden, "if apparent poor permanent success in arresting the disease should keep us from trying it and trying to improve it." We are in entire accord with Ogilvie when he says that intraspinal treatment is entitled to recognition as a rational therapeutic procedure and that a far greater percentage of all kinds of cases respond to it than to the older methods of therapy. We have persisted in the use of the Swift and Ellis procedure because there is less hazard in its use, and therapeutically it is as efficient as any. Ayer[20] has described intraspinal injections of serum under prolonged high pressure. He has been able to demonstrate the serum in the subarachnoid space over the frontal lobes. It is possible that this method may possess an increased curative value. Mercurialized serum has given us good results, although it has seemed somewhat more irritating than salvarsanized serum. Several times the injection has been followed by incontinence of urine. We have not employed cerebral puncture as suggested by Wardner;[21] there is much to commend it, and in cases of paresis of long standing it is perhaps the method to be chosen. It is certainly preferable to ventricular puncture as suggested by Hammond and Sharpe. The employment of Ogilvie's standardized serum is a conservative means of injecting salvarsan directly into the spinal canal. Its beneficial effect cannot be doubted. Cotton is using this method for cerebral puncture and mercurialized serum for both cerebral and intraventricular puncture. While the value of drainage of cerebrospinal fluid cannot be explained on theoretical grounds, yet benefit has, in our observation, followed this procedure in some hitherto intractable cases. Sachs believes that he has seen as marked and satisfactory improvement from

18. Personal communication to Dr. Riggs.
19. Amsden, George: New York Neurological Society, Jour. Nerv. and Ment. Dis., March, 1916.
20. Ayer, J. B.: Cerebral Syphilis, A Method of Treatment by Prolonged Intraspinal Injections of Serum under High Pressure, Boston Med. and Surg. Jour., **174**, No. 17.
21. Wardner, D. M.: Intracranial Injections of Salvarsanized Serum, Tr. Am. Med.-Psychol. Soc., 1915, **22**.

intravenous as from intraspinal therapy, and he has come to feel that the latter has been unduly pushed; it is more difficult to give, more likely to lead to serious complications, and at times it has been followed by disastrous consequences. Cotton says he considers intravenous injections of salvarsan more dangerous than intraspinal; that with myocardial trouble the former might prove fatal. He says:[22]

We have given as near as I can figure about 3,000 treatments in the last three and a half years, and have had no unfavorable results whatever, except one or two cases have developed an irritative meningitis which subsided within a week without any bad results.

Ogilvie states that the use of his serum "in more than 1,800 treatments has shown it to be both safe and effectual as a curative agent in types of syphilitic nervous diseases, in which intraspinal therapy is indicated." We have made over 600 injections of salvarsanized serum (Swift and Ellis method) with no serious ill effects. In one patient only, there developed an aseptic meningitis, which quickly subsided. Our experience teaches us that this method is a safe and conservative form of therapy, and should be preferred to intensive medication in all serious cases of cerebrospinal syphilis and its late manifestations, paresis and tabes. Over 74 per cent. of Ogilvie's series of cases were influenced favorably to a degree not attained by the most heroic intravenous treatment, either with or without mercury.

CONCLUSIONS

1. Both clinically and biologically it has been demonstrated that treatment is a material benefit to the paretic.

2. Before the salvarsan era, the number of remissions varied from 4 to 20 per cent. Since its use and the employment of modern forms of therapy, they have been greatly increased in frequency.

3. Treatment, to be effective in paresis, must be given in its earliest stage; in cases of long standing it is useless; cell destruction cannot be replaced. Also, to be effective, it must be persistent. It may be a matter of many months before the activity of the infection can be influenced.

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22. Personal communication to Dr. Riggs.

A Warning Against Trichinosis.—The federal meat inspectors do not inspect pork or pork products to determine the presence or absence of the organisms causing trichinosis, as even careful microscopic examination is unreliable. They do require, in establishments under their supervision, that pork that is to be made into products to be eaten raw shall be heated or subjected to extreme cold so as to destroy such organisms, but as federal inspection covers only establishments engaged in interstate commerce, it is not safe to rely on it altogether. Even such products should be avoided unless they are known to have come from establishments under federal or equivalent inspection. In fact, the Bureau of Animal Industry, United States Department of Agriculture, in a warning just issued against the danger in raw pork, gives no countenance to its use as an article of diet, but emphatically sets forth that the safest plan is to eat no pork products of any kind raw. According to the bureau, the records show that the number of cases of trichinosis increases during the holidays, partly because of hog-killing time, and partly because farmers frequently make up special forms of sausage which are eaten without cooking. The rule of safety laid down by the bureau is to cook pork until it has lost its red color throughout all portions, or, if a trace of this color is still present, at least until the fluids of the meat have become more or less jellied.

Therapeutics

DISTURBANCES OF THE KIDNEYS

(Continued from page 120)

CASTS

There are several kinds of tube casts: (1) hyaline; (2) epithelial; (3) blood; (4) granular; (5) fatty; (6) waxy or amyloid, and rarely (7) bacterial. Cylindroids formed from so-called mucus are shorter and broader than hyaline casts, but are less firm in structure, being readily broken up. They are of no significance except when they occur in considerable numbers, when they indicate kidney irritation and an abnormal increase of mucous secretion. Cylindroids and hyaline casts are formed from the same substance as that which forms the mucous threads sometimes found in the urine.

1. A hyaline cast is a secretion of this mucus, perhaps by the glomerulus, which has remained in a tubule until it has become formed and shaped, although its size may not represent the region of the kidney from which it comes, as the tube may have become dilated. Most hyaline casts probably come from the Henle loops. Albumin passing through the glomeruli may also coagulate and form hyaline casts. It is probable that a hyaline degeneration may occur in certain pathologic conditions and in acute infection of the epithelial cells of the tubules, and hyaline casts be thus formed. Both cylindroids and hyaline casts are more likely to be found in concentrated and acid urines, as low specific gravity urine and neutral and alkaline urines cause disintegration of these frail structures. Like cylindroids, hyaline casts indicate only kidney irritation and a sluggish urinary flow in some part or parts of the kidneys. Of course the freer the flow of urine, the shorter time will mucus or any other substance remain in the tubule.

High power microscopic examination shows hyaline casts to have many organized particles and not to be absolutely homogeneous.

Not only hyaline, but also epithelial and fine granular casts may be found in the centrifuged urine of normal persons, especially if this urine is first sedimented. However, they usually represent some slight kidney irritation. If hyaline casts are repeatedly found in the urine of the same person, particularly if he is over 40 years of age, and if there are traces of albumin, it may indicate the beginning of chronic interstitial nephritis; but it should be emphasized that hyaline casts can occur with physical strain, with mental anxiety and mental strains that would disturb general metabolism or the circulation, and with any acute infection, even the simplest.

2. Epithelial casts represent hyaline casts with loosened epithelium of the tubules, and the form of the epithelium may denote the region of the kidney in which the casts originated. Irritation or passive congestion may cause this type of casts to occur in slight disturbances, as well as in tubular nephritis.

3. Blood casts show acute kidney congestion or kidney hemorrhage, and are composed of blood cells and serum. Many epithelial, hyaline and finely granular casts may show both white and red corpuscles. Blood casts are most frequent in acute nephritis. When found in hematuria, they show that the bleeding, in part at least, is from the kidney structure. Even when in acute nephritis the blood casts are in large amount, they may not be of serious omen unless the patient is

uremic. With signs of uremia and serious kidney congestion, the prognosis is unfavorable.

All urines will contain some leukocytes and frequently red cells, which may come from any part of the tract. However, unless the urine has been obtained by the ureteral catheter (without injury), or there are blood casts or blood cells in casts, it cannot be positively stated that these blood cells come from the kidney.

4. Granular casts are degenerated epithelial casts. When there is a diffuse nephritis and degeneration occurs in the epithelial cells of the convoluted tubules, more or less débris is thrown into the lumen of the tubules which, remaining there for some time, causes the production of granular casts, in the beginning, with fine and later with coarse granulations. When, with degenerative disease of the epithelium of the tubules, there is a large amount of urine passed, the débris may not remain in the tubules long enough to form casts; consequently such urine, when centrifuged, will show epithelial and granular débris. Also, long and rapidly centrifuged urines may have the granular casts broken down, forming débris.

5. Fatty or oily casts represent fatty degeneration of epithelial casts. They may be composed wholly of fat or of oil, or may be epithelial or granular casts containing oil globules due either to an infiltration or to degeneration of the cell contents. They generally indicate a serious diseased condition, and occur when there is chronic nephritis of any type which has been of considerable duration.

6. Waxy or amyloid casts are somewhat like hyaline casts, but show amyloid reaction. They are not necessarily confined to amyloid infiltration or degeneration of the kidneys, but are signs of severe nephritis, and may be due to a degenerated blood coagulum. They are either straight, bent or twisted, and represent molds of the convoluted tubules. The hemorrhage may be from the glomeruli, the blood remaining in the tubules, or it may come directly from the walls of the tubules. It should perhaps be emphasized that waxy casts do not necessarily denote amyloid disease of the kidneys.

7. Serious kidney infection is sometimes accompanied by casts of bacteria in the urine. However, before deciding that these casts come from the kidneys, one must be certain that the urine examined is fresh, as rolls of bacteria resembling casts frequently occur in old urine.

Casts may come from one or more infected regions of the kidneys, but may represent an acute or chronic disturbance of just one portion. They do not disturb the general function of the kidneys, though they must impair that of the parts affected. In this relation we should bear in mind the great recuperative power of the kidneys.

(To be continued)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

ACETYLSALICYLIC ACID.—Acidum Acetylsalicylicum.—Acidum Acetylosalicylicum.—Aspirin.—$C_6H_4O(CH_3CO).COOH$, 1:2.—The acetyl derivative of salicylic acid.

Dosage.—From 0.3 to 1 Gm. (5 to 15 grains), repeated once in three hours until symptoms of salicylism (ringing in the ears, etc.) are noted. It may be administered in the form of a powder, wafers, or capsules. If prescribed as a powder, this may be administered by dissolving it in sweetened water, or by placing it on the tongue followed by a swallow of water. The powder should be dispensed in wax paper.

Acetylsalicylic acid may be obtained by the condensation of acetyl chloride or acetic anhydride with salicylic acid, and subsequent purification by recrystallization from chloroform or other suitable solvent.

It occurs in small colorless crystals or as a white crystalline powder; odorless; of acid taste and reaction; melting point from 134 to 136 C. It is sparingly soluble in cold water, gradually decomposing into acetic and salicylic acids; rapidly decomposed by boiling water; freely soluble in alcohol, soluble in chloroform and ether; also soluble, with decomposition, in solutions of alkali hydroxides and carbonates.

When 0.5 Gm. of acetylsalicylic acid is treated with 10 Cc. of warm sodium carbonate solution (10 Gm. $Na_2CO_3+H_2O$ in 100 Cc.) a clear solution results.

When 0.5 gm. of acetylsalicylic acid is boiled for from two to three minutes with 10 Cc. of 5 per cent. sodium hydroxide solution, and to the cooled solution 10 Cc. of diluted sulphuric acid are added, a crystalline precipitate is produced, which, after washing and drying, responds to tests for salicylic acid, and the filtrate has the odor of acetic acid.

If to a solution of 0.1 Gm. of acetylsalicylic acid in 5 Cc. of alcohol 20 Cc. of water be added and then a drop of diluted ferric chloride solution (1 volume of ferric chloride test solution to 4 volumes of water) no violet coloration should be produced (salicylic acid).

When 0.5 gm. is shaken with 25 Cc. of distilled water for five minutes and filtered, 5 Cc. portions are not affected by hydrogen sulphide (absence of heavy metals), nor with silver nitrate solution (absence of chloride), nor with barium chloride solution (absence of sulphate).

When heated on platinum, 0.5 Gm. should leave no weighable residue.

It should be kept in well-stoppered containers.

IOCAMFEN.—A liquid obtained by the interaction of iodine 10 parts, phenol 20 parts and camphor 70 parts, containing about 7.25 per cent. free iodine.

Actions and Uses.—Iocamfen is said to have the antiseptic and germicidal properties of iodine and also the analgesic, stimulating and antiphlogistic properties of camphor and phenol.

Iocamfen is used especially in the treatment and dressing of surgical and traumatic wounds, joint injuries, fractures, infected processes, contusions, etc.

Dosage.—Iocamfen is applied in small quantities directly to wounds, the skin, cavities, etc., or on tampons or drainage material. It should not be applied to wet surfaces.

Manufactured by Schering and Glatz, New York. No U. S. patent. U. S. trademark No. 112,934.

Iocamfen Ampules.—Each ampule contains iocamfen 20 minims.

Iocamfen is a dark, reddish-brown, viscid liquid, having a camphoraceous odor. Iocamfen is insoluble in water, but soluble in all proportions in alcohol, ether, benzine and liquid petrolatum.

Iocamfen, like free iodine, interacts with fats and waxes, its free iodine entering into combination.

The free iodine content of iocamfen may be determined as follows: About 2 Gm. iocamfen is weighed into a glass-stoppered flask, dissolved in about 25 Cc. chloroform, about 10 Cc. potassium iodide solution (1:10) added and the free iodine determined by titration, under agitation, with tenth normal sodium thiosulphate solution, using starch as indicator.

Comparison of Rural and Urban Mortality.—In an analysis of the figures shown in the new United States life tables based on the United States Census of 1910 and the mortality statistics for 1909, 1910 and 1911 in the original registration states, J. W. Glover (*Public Health Reports*, Jan. 5, 1917), says that the excess of city over rural mortality should receive the attention of health authorities to determine its cause and to what extent it may be reduced. Out of 100,000 births of males in the country, 58,117 survive to the age of 60, while among the same number of city births only 43,454 survive to that age. Glover says these figures are so astounding that they deserve the utmost prominence. Recent life tables, it is said, show similar differences in England and Germany. The tables also show that the mortality rates among women are lower throughout the entire range of life than for men and that the expectation of life is much greater. A striking exception is in the case of women in rural communities. Between the ages of 20 and 40, the mortality rate for rural women is almost as great as that for men, except from 25 to 31, in which period it is actually greater. The same is true for negro women from the ages of 10 to 20.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street . . . Chicago, Ill

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

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SATURDAY, JANUARY 20, 1917

SOME EFFECTS OF EPINEPHRIN ON THE DISTRIBUTION OF THE BLOOD

Early in the investigation of the action of extracts of the suprarenal glands and the preeminently active component, epinephrin, produced by them, it became apparent that this substance can exert a pronounced local vasoconstriction. The contraction of arterioles which it brings about has rendered it one of the most powerful local styptics; in the same way not only hemorrhage but also inflammation is diminished in mucous membranes to which solutions of epinephrin are applied locally. The first classic researches on the effects of suprarenal extracts injected directly into the circulation showed as the invariable outcome a pronounced rise of blood pressure in the arterial system. As the pressor response was apparently brought about by diminution in the caliber of the blood vessels, particularly in the abdominal areas, it seemed more than probable that the blood must be driven more effectively into other areas as the result of such special vasoconstriction. It is not surprising, therefore, that it was soon concluded that the function of the suprarenals is so to regulate the blood vessel caliber throughout the body that an adequate circulation to the vital tissues can be maintained with a minimal cardiac effort.

The physiology of the suprarenals and epinephrin has grown much more complex since these pioneer investigations were completed about twenty years ago. The pendulum of opinion respecting the real physiologic significance — rather than the pharmacodynamic potency — of epinephrin has swung back and forth with each new announcement of experiments. For a time it appeared as if the actual participation of suprarenal secretion in the regulation of blood distribution was of doubtful occurrence. Gradually, however, the discoveries of the relations of epinephrin to the sympathetic nervous system have made it seem most unlikely that in normal life suprarenal secretion should fail to play an important part. We know that it acts preeminently on all the functions innervated by the sympathetic system. The action of epinephrin on any organ is always the same as the effect produced by excitation of the sympathetic nerve supply to that organ. It may vary in different species, just as in some the stimulation of a sympathetic nerve may cause activity, while it causes inhibition in others. Furthermore, the action of epinephrin does not seem to be limited solely to these effects on the sympathetic end-organs. Lately the possible physiologic importance of suprarenal secretion has been enhanced by the seemingly well founded claims that the stronger emotions lead to discharge of epinephrin into the circulation in more than normal amounts. The mobilization of carbohydrates, the efficiency of muscle, the coagulability of the blood, and other functions are said to be affected in ways which make for physiologic preparedness in times of bodily stress.

It has been well said that theoretically any hormone might exercise a profound influence on body functions by shifting the circulation in favor of one organ at the expense of another.[1] This has led Hoskins and his collaborators[1] at the Northwestern University Medical School, Chicago, to give renewed attention to the possibilities suggested. The subject is, of course, not a new one, and the contradictions reported are numerous. The data are in many cases fragmentary and incoordinated, having been obtained from observations on isolated organs or localized structures without due regard to the interrelations which may and doubtless do exist between widely different parts of the body. The new studies indicate that, in an intact animal, epinephrin in any general sense is neither a vasoconstricting nor a vasodilating agent. It is one or the other, depending on what vessels are involved. In some cases, as in the lungs, the effect seems to depend on the dosage. Epinephrin injected intravenously in the intact animal generally, though not inevitably, causes in all doses a constriction of the limbs; but when the skin of the part is removed, the contraction is converted to expansion. There is active vasodilatation in the muscles, whereas the cutaneous vessels experience vasoconstriction. Accordingly, the Chicago investigators point out that one cannot generalize to the effect that the splanchnic vessels are constricted while the peripheral vessels are dilated. In the peripheral circulation are included not only the skin but also other less extensive structures which respond by constriction, while observations have shown that the intestine is often dilated. The effect of epinephrin in such a structure as a limb is a composite one, the limb as a whole either contracting or expanding, depending on whether vasodilatation in the muscle or vasoconstriction in the skin predominates.

Considerable emphasis has been placed recently on the possible part played by an outpouring of suprarenal secretion in promoting muscular efficiency. Hoskins, Gunning and Berry suggest that the selective vasodilator effect of epinephrin in skeletal muscle probably

1. Hoskins, R. G.; Gunning, R. E. L., and Berry, E. L.: The Effects of Adrenin on the Distribution of the Blood, I, Volume Changes and Venous Discharge in the Limb, Am. Jour. Physiol., 1916, 41, 513.

accounts to a considerable degree for its favorable influence in improving contractile activity as well as hastening recovery from fatigue. To these considerations may be added the newer evidence of long claimed possible physiologic interrelationships between the thyroid and suprarenal tissues in the body. Augmented thyroid secretion called forth by stimulation appears to sensitize the sympathetic structures so that they respond more effectively to suprarenal secretion.[2] The action of thyroid secretion on sympathetic endings is a selective one, for there is no concomitant increase in excitability of the augmentors of the heart. Thus the physiology of the endocrine organs has become involved in a maze of complexities through which the light of intelligible interpretation is only beginning here and there to find its way.

ACETYLSALICYLIC ACID, NOT ASPIRIN

The Council on Pharmacy and Chemistry publishes a report in this issue giving its reasons for deleting "Aspirin-Bayer" from New and Nonofficial Remedies. In order that a standard may be provided, the drug, acetylsalicylic acid, is retained[3] in N. N. R. under its scientific name, acetylsalicylic acid, aspirin appearing as a synonym. The attempt on the part of the Bayer Company to perpetuate the monopoly it has had for seventeen years in the United States was briefly discussed editorially in THE JOURNAL, Aug. 12, 1916. We quoted from *Printers' Ink*, a magazine devoted to advertising, in part as follows:

"The manufacturers of aspirin are about to launch an extensive advertising campaign to clinch the market as far as possible before the expiration of their patent rights next year. . . . The purpose of the campaign is to identify the product with the trademark of the Bayer Company and to this extent hamper competition after the expiration of the patent."

It is worth while reminding physicians of the privileges the Bayer Company has enjoyed for so many years, owing largely to our inequitable and crude patent laws, or to their construction. First, it should be remembered that practically no other country in the world, not even the original home of the preparation, would grant a patent on either acetylsalicylic acid, the product, or on the process for making that product. The United States granted both! As a result, for seventeen years it has been impossible in this country for anybody except the Bayer Company to manufacture or sell acetylsalicylic acid, either under its chemical name or under any other name. Neither was it possible for individuals, hospitals or any other institutions to import it, legally, for their own use.

Needless to say, the American people have been made to pay exorbitantly for the monopoly our patent office granted this firm. Three or four years ago THE JOURNAL, through the American consuls, obtained information regarding the price at which acetylsalicylic acid was sold in foreign countries. At that time, acetylsalicylic acid, as "aspirin," was costing American druggists — and of course the American public had to pay still more for it — 43 cents an ounce. Just across the border in Canada it sold for one-third the price asked here. In some of the foreign countries, acetylsalicylic acid under its scientific name could be purchased by the druggists of those countries at from one-sixth to less than one-tenth the price that it cost American druggists. Here are some of the figures:

Austria-Hungary	4 cents an ounce
British Isles	6 cents an ounce
Denmark	4 cents an ounce
France	4 cents an ounce
Germany	4 cents an ounce
Holland	4 cents an ounce
Norway	4 cents an ounce
Sweden	4 cents an ounce
United States	43 cents an ounce

Not content with the iron-bound monopoly which it had been granted through our patent laws, the company attempted further to clinch its exclusive rights by giving the preparation a fancy name, "aspirin," and getting a trade-mark on this name. The patent on acetylsalicylic acid expires next month (February, 1917). After its expiration the product, and its method of manufacture, become common property. American manufacturers will now be able to do what manufacturers in other countries, other than the patentees, have long been doing — make and sell acetylsalicylic acid.[4]

Unfortunately, it is extremely improbable that any American manufacturer will market acetylsalicylic acid under the name aspirin, although we believe they would have a legal right to do so. The courts have held in related instances that when a patented article has been known during the life of the patent under a trade-marked name, with the expiration of the patent the name as well as the product becomes common property. The classical "Singer Sewing Machine" decision and the lanolin case are in point. The Bayer Company, through a widespread newspaper advertising campaign, seems to be attempting to perpetuate its seventeen-year monopoly by leading the public to believe that there can be only one brand of genuine acetylsalicylic acid on the market — that made by the Bayer Company.

The firm will, of course, continue to manufacture and advertise the product under the name "Aspirin-Bayer," and will probably charge high prices for it, as was the case with phenacetin (acetphenetidin). In

2. Levy, R. L.: Studies on the Conditions of Activity in Endocrine Glands, IV, The Effect of Thyroid Secretion on the Pressor Action of Adrenin, Am. Jour. Physiol., 1916, 41, 492.

3. See page 213, this issue.

4. The Bayer people may try to convey the impression that "Aspirin" is pure and reliable whereas other brands are not. Since acetylsalicylic acid is a definite chemical compound, there is no more likelihood of this being sophisticated than there is of quinine being adulterated. Furthermore, the Council in accepting acetylsalicylic acid for New and Nonofficial Remedies has provided standards of purity which will insure a uniform product. The brand of one firm—Powers-Weightman-Rosengarten Co., of Philadelphia, has been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies, 1917.

any event, physicians hereafter should do what for a long time we have been advising should be done, namely, prescribe the compound under its scientific name, acetylsalicylic acid. They should do this if for no other reason than that they would be using the name which carries with it a reminder of the composition of the preparation. Of course, for those who have been writing "aspirin" it will be rather difficult to write "acetylsalicylic acid," just as a quarter of a century ago it was difficult for the physician of that day who had been using the copyright name "antifebrin" to write "acet-anilid," a name which nowadays is easy, even for laymen.

GASES, FIRES AND EXPLOSIONS IN MINES

Among the dangers involved in the hazardous occupation of coal mining, those attaching to the gases which may contaminate the air are prominent. Up to and including 1912, in 275 coal mine accidents in the United States, in which five or more men were killed, involving a total loss of 6,777 men, 5,111, or about 75 per cent., were killed by gas and coal dust explosions, the next largest category of fatalities including those by mine fires and amounting to somewhat over 15 per cent.[1]

Black damp or choke damp, the miner's term for what the chemist discovers to be carbon dioxid, is almost always present in mines in quantities exceeding that in which it appears about us under ordinary conditions of life. As carbon dioxid is a product of decomposition, of combustion, and of respiration in man and animals — all factors which play a part in mining operations — the accumulation of this gas in the absence of good ventilation can readily be understood. The essential danger of carbon dioxid lies in its possible interference with respiration; on combustion it has at most an antagonistic effect.

There are other possible poisonous mine gases, however, such as hydrogen sulphid, or stink damp, and carbon monoxid, the latter of which is highly poisonous even in small quantities. For the detection of harmful proportions of the latter, Haldane recommended the use of birds and mice, which succumb to a concentration of carbon monoxid at which men show no symptoms of distress. Hydrogen sulphid may be found occasionally as an occluded gas in coal seams. In other mines it is usually the product of decomposition of the sulphid-containing pyrites in the presence of moisture. When mixed with air it is violently explosive.

In mine fire explosions it is undoubtedly methane, hydrogen and carbon monoxid which play a significant rôle. How these gases, dangerous because of their explosibility when mixed with air, arise in mines is not so widely understood. Methane, also known as carburetted hydrogen or marsh gas, is a product of decomposition of organic matter and thus can come from pores and pockets in coal, at ordinary temperatures, and can also be produced by heat reactions. Hydrogen and carbon monoxid are not found normally in coal mines; hence their presence in the gases of mines which are on fire is due to the destructive distillation of the coal or wood, the action of carbon dioxid and hot coal or wood, and the action of steam on hot carbon. The experts of the Bureau of Mines have pointed out in a recent technical paper[2] that in a fire above ground, combustion may be complete because sufficient air can be supplied to the burning material to permit the formation of carbon dioxid and water as the principal products of combustion. On the other hand, a mine fire, as a rule, is quickly covered with fallen coal, slate, timber, etc., and the oxygen content of the mine atmosphere is more or less rapidly diminished, and oxygen does not have ready access to the burning fuel. As a consequence, combustion soon becomes incomplete, and intermediate products of combustion, such as carbon monoxid, are formed. The character and quantity of the gases produced differ according to the stage of the fire, from the time it is first noticed, through the period during which it is being fought, and up to and through the time it is sealed, if sealing becomes necessary. The changes which take place may be studied by comparing mine fire combustion processes with changes which coal undergoes, and the gases which are given off when the coal is subjected to different combustion processes above ground. Such studies have to do with the destructive distillation of coal in retorts, as in making illuminating gas, the manufacture of coke in coke ovens, the production of producer gas, and the burning of coal in boiler furnaces. In mine fires, chemical reactions may occur which are related to the reactions which take place during any of the foregoing well known processes, from that of complete combustion, as in properly fired boiler plants, to destructive distillation, as in gas-house retorts, in which practically no oxygen enters into reaction except that from the coal. It is thus that methane, carbon monoxid and hydrogen in particular arise.

Usually the methane which makes a mine gaseous is largely responsible for explosions which take place when ventilation is stopped, but the other inflammable gases produced by fire may likewise become largely responsible. According to Burrell and Oberfell,[2] methane is the most dangerous gas as regards low limit of explosibility, whereas carbon monoxid and hydrogen are especially dangerous because of their wide explosive ranges. In the low-temperature destructive distillation of coal in mine fires, the principal danger is from methane. As regards a mine fire which has been

1. Kober and Hanson: Diseases of Occupation and Vocational Hygiene, Philadelphia, 1916, p. 619.

2. Burrell, G. A., and Oberfell, G. G.: Explosibility of Gases from Mine Fires, Bureau of Mines, Technical Paper 134, Washington, D. C., 1915.

burning for some time, it is probable that when the oxygen of the air has been so depleted that products of destructive distillation appear, the embers will have cooled to a point at which the low-temperature products are given off in largest quantity.

According to the government experts, carbon monoxid formed by the reducing action of hot carbon on carbon dioxid is a highly important agent in some mine fire explosions; but it is probable that water gas (carbon monoxid and hydrogen), produced by the action of steam on hot carbon, plays a relatively unimportant rôle in causing mine fire explosions.

THE HEALTH OF MUNITION WORKERS IN RELATION TO THEIR WORKING OUTPUT

The European war has forced attention in an acute way to the problem of the working day, which was recently referred to in THE JOURNAL[1] as being primarily a question in physiology. It is at first thought almost unbelievable that in a grim struggle in which life is being sacrificed daily in the most reckless and ruthless manner the participants should attempt to make detailed inquiries respecting the relation of conditions of work to the efficiency of the worker. Yet this has been done in a variety of ways; for all the combatants realize in this war, as never before, that the dictates of science demand just consideration in a competitive struggle of the most intense description.

Overwork which leads to the inefficiency attributable to undue fatigue may be as detrimental as the indifference of the "slacker" who, though fully able to work, fails to meet his working obligations. For this reason, evidently, the British minister of munitions has appointed a committee "to consider and advise on questions of industrial fatigue, hours of labor, and other matters affecting the personal health and physical efficiency of workers in munitions factories and workshops." Among the memoranda already published by this committee, a recent memorandum prepared by Dr. H. M. Vernon[2] of the University of Oxford gives instructive statistical information concerning output in relation to hours of work in munition factories under government supervision. Many women, for example, were supposed to work more than seventy hours a week in some of the munition plants. An actual determination of the output of these employees before and after the reduction of the hours of work under otherwise comparable environmental conditions leaves little doubt that, even aside from any physiologic benefit to the working individual, a great gain results in the fact that as much or even more was actually accomplished in the shorter period. Thus, in speaking of one group, Vernon states that it is probable that the sixty hours of work a week were still too many to give the best total output, but they justify the statement that, in order to attain a maximum output, women engaged in moderately heavy manual labor should not work more than sixty hours a week. The conclusion derived from observations is that an equally good total output could be maintained if the actual working hours were reduced to fifty-six or less a week. Vernon appreciates that it might be thought that the great improvement in hourly output under the shorter hours' regimen was due, partly or wholly, to increased skill of the operatives or improvements in the machinery. Neither of these hypotheses can be substantiated.

Further proof of the advantage of shorter hours was afforded by the output data of some of the operatives on an earlier occasion. One group of seventeen worked only from 51 9/10 to 62 9/10 hours a week for five weeks in June and July, and during the last three weeks of this period their hourly output was 18 per cent. greater than that of another group of fourteen operatives who were working the usual long hours. Subsequently, when the two groups worked the same long hours, their output was identical.

The desirability of considering the type of work involved and perhaps even the individual in the regulation of working conditions — a feature emphasized by Lee[3] — is likewise expressed in Vernon's observations. He concludes that the hours of labor should be varied between wide limits according to the character of the work performed. This obvious fact is not realized by many managers of munitions works, and the tendency is usually toward uniformity of hours for all types of labor and for workers of both sexes. The British data suggest that not only are women unsuited to the heavier types of work, but that even when engaged on the moderate and light types they are unable to stand such long hours as the men. Several sets of operatives, both male and female, were kept under close observation for many days in order that their powers of application might be investigated. Men engaged in boring the powder chamber and in turning and finishing shells were found, almost without exception, to stick to their work with admirable persistence, seldom resting even for a minute. On the other hand, women engaged in turning fuse bodies rested for various periods which in the aggregate amounted to one and one-half hours out of the twelve-hour day, and over an hour out of the ten-hour day, in addition to the hour or so of compulsory rest required for attention to their lathes at the hands of the tool setters. About half an hour of the voluntary rest pauses occurred at the beginning and close of work, but much of the remaining hour or half hour was probably due, not to idleness on the part of the women, but to fatigue, and to an instinctive knowledge

1. Physiologic Aspects of the Working Day Problem, editorial, THE JOURNAL A. M. A., Jan. 13, 1917, p. 122.

2. Vernon, H. M.: Statistical Information Concerning Output in Relation to Hours of Work, Health of Munition Workers Committee, Memorandum 12, 1916.

3. Lee, F. S.: Is the Eight Hour Working Day Rational? Science, Nov. 24, 1916, p. 727.

that short rest pauses helped to prevent undue fatigue.

In considering the specific facts related in the British memorandum, it must be remembered that the work is being conducted under great stress. Realizing this, Vernon says that the hours still in force necessarily impose a great strain on the operatives, and there can be no doubt that in many instances the strain is too great to be borne, and that the operatives are compelled to drop out altogether. That is to say, the data quoted relate to the fittest who were strong enough to survive in the struggle, and not to the general mass of workers of all classes who tried to do munition work. It is almost impossible to discover the extent of this weeding out, but it is inevitably considerable. Hence the best hours of work, suited for peace times, are in every case considerably shorter than those mentioned, though the principle of graduating the number of hours of labor to the type of work performed still holds with undiminished force.

Current Comment

CREATINURIA IN CHILDHOOD

Although creatinuria in adults is commonly believed to belong essentially to the pathology of metabolism, the excretion of creatin along with creatinin in the urine of children has been accepted as a phenomenon of normal character ever since it was carefully studied by Rose.[1] Creatin is usually excreted by children until the age of puberty. It forms a fairly large component of the total creatin plus creatinin present in the urine at this early period of life. No satisfactory explanation for this peculiar difference between the metabolism of the young and the adult has been given until recently, when Powis and Raper[2] made observations on the incidence of creatinuria which may help to throw light on the problem. They found in a study of the diurnal and nocturnal variations in the excretion of creatinin and creatin in children that the rate of creatinin output is slightly less during the night than during the day. More striking is the fact that the rate of creatin excretion is highest during the morning, less during the latter part of the daytime, and very small at night. The chief factor in the output of creatin appears to be the state of rest of the skeletal muscles associated with the temporary cessation of voluntary control which occurs during sleep. Powis and Raper conclude that the results so far obtained are most simply explained by assuming that creatinuria in children is due to the immaturity of the muscles. Creatin is not entirely an index of endogenous metabolism in the way that creatinin is, because the two do not show parallel variations. This may be due to the fact that creatin is utilizable, whereas creatinin is not. The production of creatin at night is probably lower than during the day, and anabolic processes at rest, by utilizing or destroying part of it, cause a further diminution in the amount excreted. Sleep is apparently not the only factor involved, since creatin excretion during the afternoon is less than during the morning. In a case of amyotonia congenita studied by Powis and Raper[2] at the University of Leeds, the excretion of creatinin per kilogram of body weight was much lower, and that of creatin much higher, than for a normal child of the same age. Morse[3] has found a high creatin content in the urine of children with diseases involving atrophy. These involved less extreme cases of muscular immaturity than amyotonia congenita, in which the muscles are soft, toneless and underdeveloped. Putting the known facts together with these observations, the British investigators conclude that the fully matured muscle produces only creatinin, and no creatin, or only such small amounts that utilization processes prevent their coming to excretion. As the child develops, the creatinin coefficient gradually increases, and the creatin diminishes until it finally disappears. This hypothesis will doubtless be tested further by students of metabolism in adolescence.

1. Rose, W. C.: Experimental Studies on Creatine and Creatinine, III, Excretion of Creatine in Infancy and Childhood, Jour. Biol. Chem., 1911, **10**, 265.

2. Powis, F., and Raper, H. S.: Creatinuria in Children, Biochem. Jour., 1916, **10**, 363.

3. Morse, M.: Creatine in Atrophy, Jour. Biol. Chem., 1916, **24**, xxviii.

TRAFFIC ACCIDENTS

At least 60 per cent. of all accidents are street and traffic accidents. Figures just announced by the Bureau of Records of the Department of Health of the City of New York show that there were 18 per cent. more deaths from accident during the first eleven months of 1916 than during an equal period in 1915. The experience of New York is not unique in regard to street accidents. The figures for Chicago and other large cities show the same alarming increase. The "safety first" campaign has not yielded the same satisfactory results in street accidents that it has in industrial establishments and for railroads. The reason is plain: cities are not managed on the business principles industrial establishments employ. Perhaps another factor is that "safety first" signs have become so common that pedestrians no longer pay attention to them. When cities study these problems in the same scientific manner that private corporations study them, and apply the remedy indicated, the number of preventable traffic accidents will decrease.

A MEDICAL METAPHOR

Stump speakers, Chautauqua lecturers and graduation orators utilize the classics, poetry and romance to add polish to their effusions; they seldom go to the sciences, and least of all to medicine, for this purpose, as did Congressman Bennett of New York, who, recently, in a discussion of a proposed rule, "brought down the House" with the following:

> What does this rule do? In the first place, it performs a cesarean operation on the Committee on Interstate and Foreign Commerce, and takes from it a resolution that it has a perfect right to show its parturitive ability by itself delivering.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Unified Health System for Birmingham.—After a conference between Dr. Francis E. Harrington, the new health officer of Jefferson County, and Dr. Cecil D. Gaston, city health officer of Birmingham, it was announced that Dr. Gaston would continue to act as city health officer. According to the plans for a unified health system prepared by Surg. Carroll Fox, U. S. P. H. S., the share of expense of the county for the new system will be about $30,000. The unified plan provides that the health supervision of the Birmingham public schools, now handled by the board of education, shall be placed under the supervision of the county health officer.

ARKANSAS

Birth and Death Registration.—The Supreme Court of Arkansas has decided that local registrars of births and deaths appointed by the state registrar of vital statistics are state officers and cannot be paid by the counties. In that respect the law recently passed providing for the appointment of such local registrars is held to be unconstitutional. The opinion is published in full in *Public Health Reports*, Jan. 5, 1917.

CALIFORNIA

State Society Meeting.—The Medical Society of the State of California will hold its next annual meeting at the Hotel del Coronado, San Diego, April 17.

Psychopathic Hospital Needed.—The California Society for Mental Hygiene recommends a law providing $500,000 for a psychopathic hospital to be conducted as a unit of the Affiliated Colleges under the management of the University of California. The association also endorses the establishment of a state colony in southern California for mental defectives, to cost $250,000. The following officers were elected: president, Dr. George E. Ebright, San Francisco; vice presidents, Drs. Robert L. Richards, Talmadge; Lillian Martin and Fred W. Hatch, Sacramento; secretary, Miss Julia Green, and treasurer, Mr. Knox Maddox.

Personal.—Dr. Harry J. Pittock, Pasadena, resident physician of the LaVina Sanatorium, has accepted a position as assistant to Dr. Floyd L. R. Burks, Fresno.——Dr. George B. Somers has been reappointed a member of the board of health of San Francisco.——Dr. George F. Pache, Angels Camp, is under treatment at St. Joseph's Hospital, Stockton, for septicemia.——Drs. Howard Wright, San Francisco, and Fred Cozelman, Los Angeles, have been appointed to the medical staff of the Stockton State Hospital.——Dr. Edward H. Julien, San Francisco, was seriously injured in an automobile collision, December 28.——Dr. George H. Derrick, Oakland, was held up, December 23, and robbed of his watch, fob and money.——Dr. Judson Liftchild, Ukiah, has resigned as superintendent of the Mendocino County Farm and Hospital, after ten years' service.

DISTRICT OF COLUMBIA

Education of Tuberculous Children.—The board of education has appealed to the public for $1,000 for fifty-nine tuberculous children recently excluded from school. Buildings and teachers are available, but there is no fund for transportation, blankets, clothing or food. It is expected that Congress at the present session will make provision for the education of these children after the present school year.

IDAHO

Personal.—Drs. D. E. Everette and Susie V. Standard, Burns, Ore., have moved to Nampa.——Dr. Ralph Falk, Boise, has resigned as secretary of the state board of health.——Dr. Ellis Kackley, Soda Springs, has succeeded Dr. Oscar B. Steely, Boise, as a member of the state board of health.

ILLINOIS

State Hospitals Society to Meet.—A meeting of the Illinois State Hospitals Medical Society will be held, January 25 and 26, at the Chicago State Hospital, Dunning, Ill.

Sanatorium Directors Named.—Rev. John P. Quinn, Ottawa, Mrs. Virginia LeRoy, Streator, and Dr. Kimball W. Leland, Utica, have been appointed the first board of directors for LaSalle County Tuberculosis Sanatorium, and have been given authority to select the site for the building, and to determine the kind of structure to be erected, the plans to be subject to the approval of the state board of health.

Health Consolidation in Illinois.—In the interest of economy and better administration, Governor Lowden has adopted a general policy for the reorganization of the executive department of the state government and the consolidation of as many departments and bureaus as possible. As a part of this policy, plans are being considered for the assembling in a department of health of the present state board of health, the state board of pharmacy, the state board of dental examiners, the nurses examining board, the new optometry board and others. A bill providing for a department of health with a commissioner at the head will probably be introduced early in the present session of the legislature.

Chicago

Women Hear About Health Insurance.—The Medical Women's Club of Chicago gave a dinner and reception at the college club rooms of the Chicago College Club, January 10, at which Dr. William A. Evans spoke on "Health Insurance."

Annual Meeting of Visiting Nurse Association.—At the twenty-seventh annual meeting of the Visiting Nurse Association of Chicago, held at the Blackstone Hotel, January 17, Dr. Hugh T. Patrick, on behalf of the committee on the after-care of infantile paralysis, delivered the principal address. Reports were made by the various committees, and officers and directors for 1917 were elected.

INDIANA

New Officers.—At the annual meeting of the Fort Wayne Medical Society, December 5, Dr. Charles G. Beall was elected president; Dr. Allen Hamilton, vice president; Dr. Miles F. Porter, Jr., secretary, and Dr. Elmer E. Morgan, treasurer.

Care of Mental Defectives.—The board of state charities, in its biennial report to the legislature, recommends adequate care and prevention for mental defectives. The five hospitals for the insane in Indiana are now so crowded that it is impossible to classify the patients. Instead of enlargement of existing hospitals or the building of new ones, the board recommends the purchase of farms a short distance from the hospital, yet near enough to be under its supervision. A beginning has been made in the purchase of a colony farm near the Eastern State Hospital, Richmond.

Personal.—Dr. Loren A. Hyde, Indianapolis, has succeeded Dr. Benjamin S. Potter as superintendent of the Marion County Hospital for Incurable Insane at Julietta.——Dr. Brown S. McClintic, Peru, after three years' service with the Russian army, is on his way home.——Dr. Paul F. Martin, Indianapolis, who went abroad last May under the auspices of the American Medical Relief Expeditionary Association, is now in charge of 2,000 beds in the Pardubitz Hospital, Austria, which has a capacity for 10,000 patients.——Dr. Noah D. Berry, Muncie, was knocked down by an automobile recently and suffered painful injuries.——Dr. Arthur L. Oilar, who has been ill with appendicitis in the Methodist Hospital, Indianapolis, is reported to be improving.——Dr. E. Trent Stout, Upland, has started for the border in command of an ambulance company.

IOWA

Personal.—Dr. Ella Blackburn, assistant physician at the State Hospital, Mount Pleasant, has accepted a position as assistant physician at the Kenilworth Sanitarium, Kenilworth, Ill., to succeed Dr. Margaret S. Grant, who has been appointed pathologist at the Lutheran Hospital, Fort Wayne, Ind.——Dr. Charles E. Nelson, Centerville, suffered severe injuries in a collision between streets cars in Burlington, December 26.——Dr. Thaddeus C. Cooper, Ogden, will leave in a short time for six months' work with the English forces on the western front.——Dr. Adolph M. Evetz, Carroll, was painfully injured in a runaway accident, December 22.

State Supply of Antitoxins.—The state board of health has contracted for a year's supply of antitoxin, which will be distributed from 250 stations. The board expects to increase the number of stations to 300. The state contracts for the antitoxin at less than one fourth the rate to the drug trade and then retails it at cost. The new prices for diphtheria antitoxin are: 1,000 unit package, 50 cents; 3,000 units, $1.25;

5,000 units, $1.80; 10,000 units, $3.35. Tetanus antitoxin will be sold at the following prices 1,500 units, $1.67; 3,000 units, $2.87; 5,000 units, $4. Typhoid vaccine in the three-ampule package will sell for 28 cents. These prices are lower than last year. Smallpox vaccine has also been reduced in price.

KENTUCKY

License Revoked.—It is reported that at a recent meeting the State Board of Health of Kentucky revoked the license of Dr. John Karagiozian of Louisville on the ground of his dispersing narcotic drugs for purposes other than their legitimate use.

Personal.—Drs. Lewis S. McMurtry, Hugh N. Leavell and Clarence H. Harris have been appointed, by the state board of health, members of the Jefferson County Board of Health for two years.——Dr. Philip E. Blackerby, Erlanger, has been appointed registrar of vital statistics by the state board of health, to succeed Dr. W. Lucien Heizer, Bowling Green, recently appointed secretary of the state tuberculosis commission.

MARYLAND

New Superintendent for Sydenham Hospital.—Dr. Harry H. Johnson, Baltimore, was appointed superintendent of the Sydenham Hospital, January 2, succeeding Dr. John F. Hogan, Baltimore, appointed second assistant commissioner of health.

Rare Books Presented to Johns Hopkins Library.—A number of valuable and rare old medical books, the collection of which covered thirty years, have been given to the Johns Hopkins University library by Dr. Henry J. Berkley, clinical professor of psychiatry in the Johns Hopkins Medical School.

Personal.—Dr. John T. O'Mara, Baltimore, has been appointed physician to St. Mary's Industrial School, to fill the vacancy caused by the recent death of Dr. Alexander H. Saxton, Baltimore.——Dr. Archibald C. Harrison is a patient at St. Joseph's Hospital, where he recently underwent an operation for appendicitis.——Dr. Joseph I. Lawrence, formerly associated with the American Ambulance in Paris, read a paper before the Baltimore Medical Society, January 5, on "The Method of Treating Wounds as Practiced by Carrel."

Annual Meeting of the Eudowood Board.—Dr. Henry Barton Jacobs, Baltimore, president of the board of directors of Eudowood Sanitarium, points out in his report the need of a nurses' home and advantages of the development of the farm colony into an industrial colony in which shops could be established and men could pursue their trades while regaining their health.——Dr. Martin F. Sloan, Towson, the superintendent, stated that 302 patients had been treated, 200 of whom had been discharged. Of these, seventy-nine were able to return to their former work.

Hunterian Laboratory Opened.—The Hunterian Laboratory of Johns Hopkins Medical School, the dream of the foremost physicians and surgeons of Johns Hopkins Hospital years ago, has been completed and is now formally opened. The building cost about $115,000. Its erection was made possible through the munificence of the Rockefeller Foundation. The scientific equipment alone cost many thousands of dollars. The purpose of the laboratory is to facilitate the work of the men engaged in the highest form of research work. Tunnels connect the laboratory with the medical school and the physiologic building. On the first floor are the medical library and the department of art as applied to medicine. Work at the laboratory is directed by a committee of professors and instructors of the medical school. Dr. Milton C. Winternitz is chairman of the committee, and has a laboratory on the fourth floor. The second floor has been leased to the Carnegie Embryological Institute. The third floor will be devoted to work in clinical medicine and children's diseases. The pathologic department will be located on the fourth floor.

Commission to Study Feebleminded.—After a conference with Dr. Arthur P. Herring, Baltimore, secretary of the State Lunacy Commission, the governor has announced that he will appoint a commission to study causes of mental defectiveness and to suggest preventive methods. The thirty-first annual report of the lunacy commission shows that there are at present 5,065 patients in all the institutions in Maryland, public and private. The total number under treatment during the year was 7,048, and 2,215 patients were admitted to the institutions during 1916. Of this number about 25 per cent. were discharged as recovered. The ratio of the insane to the population in Maryland is 1:270. The State Lunacy Commission asks that the investigating commission be composed of two members of the last legislature, one or more of the superintendents of the state hospitals for the insane and feebleminded, a representative of the state and city public school boards, a representative of the State Board of Penal Control, the secretary of the lunacy commission, the secretary of the state board of health, and one or more persons who have given special attention to the subject in some of its phases. The governor also announced his intention of later appointing a commission to study and report on the tuberculosis situation in Maryland.

MICHIGAN

Physician Fined.—Dr. Lemen L. Harrison, Niles, charged with neglecting to notify the health authorities of a case of scarlet fever, pleaded guilty and was fined $10 and costs.

Personal.—A farewell reception was given in honor of Dr. Gale W. Huber, Detroit, city physician at the Receiving Hospital, December 4.——Dr. Robert A. McGregor, Jackson, has been appointed state prison physician.——Dr. William H. Cressy, who has been serving in the Russian Medical Corps, is home on leave and is visiting in Grand Rapids.——Dr. Henry T. Sethney, Menominee, is ill with diphtheria.

MISSOURI

Personal.—Dr. William E. Minor, Kansas City, has recovered from an operation for appendicitis.——Dr. Eugene H. Bullock, Edina, has been selected as superintendent of State Hospital No. 2, St. Joseph, succeeding Dr. William L. Whittington.——Dr. Hasbrouck Delamater, Kansas City, has been appointed full time health officer of St. Joseph.——Dr. Austin B. Allen, Marysville, has retired after nearly forty years of practice. He will spend several months in southern California.

St. Louis

Gifts to Society.—The heirs of Dr. Charles H. Klie have presented a bust of Aesculapius and a number of volumes to the library of the St. Louis Medical Society.——Vice President William H. Stauffer has presented a clock to the society.

The Workman's Compensation Law.—The meeting of the St. Louis Medical Society, January 13, was devoted to the proposed Workman's Compensation Law for Missouri, which comes before the legislature for action this month or February. The subject was presented by Dr. Malcolm A. Bliss.

Personal.—Dr. Hugo Summa will spend several months in California.——Dr. Malvern B. Clopton, associate in surgery in Washington University Medical School, who has been on duty with the American Ambulance in Paris, delivered an illustrated lecture recently on "American Ambulance Work in Paris," at the annual meeting of the Pilgrims' Congregational Church Brotherhood.——Dr. W. H. Wiedemann will deliver a lecture before the St. Louis Academy of Medicine, January 29, on "Chemistry of High Explosives and Poisonous Gases as Used in the European War."——Drs. Walter C. G. Kirchner, Lux H. Bock, Benjamin W. N. Klippel and Allan A. Gilbert have been appointed to the St. Louis Unit of the American Physicians' Expeditions Committee.

NEW JERSEY

Personal.—Dr. Albert Pittis, Plainfield, is reported to be seriously ill with septicemia, due to an operation wound, in the Muhlenberg Hospital, Plainfield.——Dr. Millard Knowlton, health expert and publicity agent for the state department of health, Trenton, has resigned.——Dr. Charles S. Braddock, Jr., Haddonfield, is reported seriously ill in New York as the result of a cerebral hemorrhage.——Howard E. Winter, Plainfield, has been appointed a member of the state department of health, to succeed the late Dr. John R. Everett, Trenton.

NEW YORK

Hospitals for Insane Overcrowded.—The State Hospital Commission reports that $2,000,000 a year for the next five years must be spent to provide for the insane in New York. There are 34,000 insane persons in the state hospitals, which have a normal capacity of 28,000. The commission favors the construction of a new hospital at Mohansic and of new buildings at Marcy, near Utica, where 1,500 of the insane of New York City could be sent.

New York City

Health Department to Furnish Pneumonia Serum.—The city department of health announces that it will supply for the treatment of lobar pneumonia a serum perfected by the Rockefeller Institute of Medical Research.

Health Department Will Examine Cancer Tissue.—The budget of the department of health for 1917 provides for a pathologist who will examine tissue for cancer diagnosis. The work will be conducted under the bureau of laboratories as soon as the details can be arranged.

Staffs of City Hospitals Dine.—The medical staffs of the nine hospitals of the department of charities, about 450 physicians, dined recently at the Hotel Astor. Commissioner John A. Kingsbury was toastmaster. Among the speakers were Mayor Mitchell, Comptroller Prendergast, and Drs. James J. Walsh and Orrin S. Wightman. This is the first time that all the attending and house physicians of the city hospitals have been called together.

Report of Charity Organization Society.—The report for the fiscal year, ending Sept. 30, 1916, shows that while practically the same number of persons received aid as during the years of 1912 and 1913, the years immediately preceding the period of widespread unemployment, there has been an increase in the amount of illness encountered. In 3,000 families 2,016 cases of illness were found, including tuberculosis, respiratory and digestive diseases, rheumatism and paralysis. In 198 instances there were mental defects, and in about 20 per cent. of the cases alcoholism and the use of drugs were complicating problems.

Personal.—Dr. Hermann M. Biggs, state commissioner of health, has been granted an indefinite leave of absence on the urgent request of the Rockefeller Foundation, that he may go to France to study the tuberculosis problem there and organize measures to combat the spread of the disease in that country. Dr. Biggs is accompanied by Dr. Alphonse R. Dochez of the Rockefeller Institute.——During the absence of Dr. Biggs, Dr. Linsly R. Williams, deputy health commissioner, will be the acting commissioner.——Dr. Alfred E. Shipley, Brooklyn, has been appointed secretary of the board of health, to succeed Eugene W. Sheffer, who was retired, January 1, after more than twenty years of service.——Dr. John S. Billings, Jr., deputy commissioner of health, and director of the bureau of preventable diseases, has resigned, to take effect May 1. Dr. Billings has been in the service of the city for more than twenty years.——Dr. Woods Hutchinson sailed on the *St. Paul* for Liverpool, January 13.

OHIO

Hospital Closed.—The Stamm Hospital, Fremont, was closed, December 30, for the first time in sixteen years. This leaves Fremont without a hospital of any kind.

Hospital Corpsman Dies.—J. S. Clifton, a former medical student in the Ohio State University, and a member of Ohio Field Hospital No. 2, died from pneumonia at the base hospital, El Paso, Texas, December 21.

State Board Meeting.—At the annual meeting of the State Medical Board in Columbus, January 2, Dr. John H. J. Upham, Columbus, was elected president; Dr. John K. Scudder, Cincinnati, vice president; Dr. George H. Matson, Columbus, secretary (reelected), and Dr. Sylvester M. Sherman, Columbus, treasurer (reelected). Eugene C. Waters, Chillicothe, was appointed on the osteopathic committee, succeeding E. R. Booth, Cincinnati.

Personal.—Dr. David E. Sheehan, director of safety of Cuyahoga Falls, has resigned to accept the superintendency of a clinic in the dental school of the Western Reserve University, Cleveland.——Physicians of Nelsonville have presented Dr. Isaac P. Primrose with a handsome leather chair, in recognition of the completion of fifty-eight years of practice in Nelsonville and vicinity.——Dr. John E. Monger, Greenville, has been appointed state registrar of vital statistics.——Dr. Martin Stamm, Fremont, will sail for South America, January 28.

Cincinnati

Appropriation for Sanatorium.—The county commissioners of Hamilton County have appropriated $25,000 for the Cincinnati Tuberculosis Sanatorium.

Medical Reserve Corps Division Organized.—The Cincinnati Section of the Association of the Medical Reserve Corps, U. S. Army, organized, December 7, and elected Lieut. Robert D. Maddox, president; Lieut. Goodrich R. Rhodes, vice president, and Lieut. Elmer A. Klein, secretary-treasurer.

Personal.—Dr. Wade W. Oliver, a member of the staff of physicians appointed by the Rockefeller Foundation to study disease in South America, who was taken ill with appendicitis while in Buenos Aires, is making a satisfactory recovery after an operation.——Dr. Ernest Zueblin, professor of medicine in the University of Maryland, Baltimore, has accepted a position on the faculty of the Medical Department of the University of Cincinnati, and will be director of the tuberculosis service at the Public Hospital.——Drs. Charles A. L. Reed and John E. Greiwe have resigned as members of the staff of the Cincinnati General Hospital.——Dr. Edward F. Nippert, of the house staff of the Cincinnati General Hospital, will sail for Germany this month for service in a hospital unit.——Dr. Gustav A. Hinnen has resigned as a member of the junior staff of the otologic service at the Cincinnati General Hospital.

PENNSYLVANIA

Record of Pennsylvania Railroad.—On the Pennsylvania lines east of Pittsburgh 196,294,146 passengers were carried last year without a fatality, and in the last four years 616,626,957 persons have been transported without loss of a life. On the entire system of the Pennsylvania Railroad, east and west of Pittsburgh, three years have passed without the loss of a passenger's life, and in this period 553,890,063 persons have been carried a total of 15,000,000,000 miles by 9,000,000 trains over 12,000 miles of railroad and 27,000 miles of trackage.

Philadelphia

Estimates Invited for Institution for Feebleminded.—The Department of Health and Charities has invited estimates on four dormitories and connection corridors at the Philadelphia Institute for Feebleminded, Byberry Farms.

Council Reconsiders Omission of Money for Nurses.—An ordinance was introduced, January 4, in the common council to provide $25,000 to reemploy the nurses who were engaged until about a week ago in caring for convalescents from infantile paralysis, but who were dropped for lack of funds to pay them.

Personal.—Dr. W. Wayne Babcock was operated on for removal of the appendix, December 15, at the Samaritan Hospital.——Dr. John K. Mitchell, who has been confined to his home with heart trouble, has greatly improved.——Dr. Richard H. Harte addressed the Philadelphia Association Medical Reserve Corps, U. S. Army, January 19, on the "American Red Cross Base Hospital."

Banquet for Dr. Jackson.—The Philadelphia Laryngological Society will tender a dinner, January 23, to Dr. Chevalier Jackson, Pittsburgh, recently called to the chair of laryngology of the Jefferson Medical College to succeed the late Dr. D. Braden Kyle. Dr. Jacob Solis-Cohen will make the address of welcome. Dr. J. Chalmers DaCosta will represent Jefferson Medical College, Dr. Edward Martin, the University of Pennsylvania, and Dr. Judson Daland, the Medico-Chirurgical College. Dr. Hobart A. Hare will act as toastmaster.

SOUTH CAROLINA

Course in Public Health.—The Medical College of the State of South Carolina has provided a course of lectures in public health. The first lecture in the course was delivered by State Health Officer James A. Hayne. Other lectures will be given during the season.

Personal.—Dr. Luther A. Riser, Columbia, has been appointed assistant in the field work of the United States Public Health Service.——Drs. Charles W. Kollock, A. Johnston, Buist, and Ernest C. Baynard, Charleston, have been elected members of the Roper Hospital Fund Commission.

New Officers.—The South Carolina Medical Society, Charleston, December 27: president, Dr. Lane Mullally; vice president, Dr. Edward Rutledge; secretary, Dr. Henry P. Wagener and treasurer, Dr. Daniel L. Maguire.——Sumter County Medical Association, December 26; president, Dr. Thomas R. Littlejohn; vice president, Dr. Archie China, and secretary-treasurer, Dr. Marvin L. Parler.——Spartanburg County Medical Association, at Spartanburg, December 29: president, Dr. James E. Edwards; vice president, Dr. W. Boykin Lyles; secretary, Dr. L. Rosa H. Gantt, and treasurer, Dr. Walter B. Lancaster.

TENNESSEE

New Officers.—At the annual meeting of the Memphis and Shelby Counties Medical Society, December 19, Dr. William Britt Burns was elected president; Dr. William F. Clary, vice president; Dr. Robert H. Miller, secretary, and Dr. W. Battle Malone, censor, all of Memphis.

Personal.—Dr. W. Scott Farmer, Cookville, has been elected superintendent of the Central Hospital for the Insane, near

Nashville, succeeding Dr. Albert E. Douglas, Nashville, resigned.——Dr. Harold S. Hulbert, Ann Arbor, has been selected by the state board of control to complete the survey of the Tennessee hospitals for the insane, and also a county survey.——Dr. Bryce W. Fontaine, Memphis, has been appointed representative of the Memphis and Shelby Counties Medical Society on the directorate of the Memphis Antituberculosis Society.

WASHINGTON

State Board Election.—At the annual meeting of the State Board of Medical Examiners, held in Spokane, January 2, Dr. Royal A. Gove, Tacoma, was elected president; Dr. Daniel M. Stone, Seattle, vice president; Dr. Conrad N. Suttner, Walla Walla, secretary, and H. R. Morse, Wenatchee, treasurer.

Combination of Boards Recommended.—State Auditor Clausen, in his annual report, recommends that the medical board, pharmacists board, embalming examiners board, dental board, optometry board, hotel inspectors board and barber examining board be consolidated under the state board of health in order to obtain greater efficiency, and to decrease the cost of operation.

WISCONSIN

Group Practice.—Six physicians of Marshfield have organized the Marshfield Clinic.

Sanatorium for La Crosse.—The County Board of Supervisors voted, December 28, to establish a sanatorium for the treatment of tuberculosis, to cost $50,000.

Milwaukee Leper.—The United States Public Health Service has notified the health authorities in Milwaukee that the government will not be responsible for the care of the Greek leper found in that city.

Children's Hospital.—The board of directors and the medical staff of the Milwaukee Children's Hospital are considering plans for the new hospital, made possible by the gift of $150,000 by Mr. Ferdinand Schlesinger, conditioned on the raising of an equal sum for the endowment of the institute.

Contagious Diseases.—On account of the spread of scarlet fever and diphtheria, the board of health at Stevens Point on December 28 closed all grade and parochial schools, the model school of the State Normal School and all junior Sunday schools. Children and young people were warned away from the moving pictures shows, stores and other places of public gathering.

New State Laboratory Opened.—The second state cooperative laboratory, organized by joint action of the municipality and the state board of health, has been opened in St. Mary's Hospital, Fond du Lac, in charge of Dr. Frederick M. Harris, La Crosse, as director. The state board of health grants state aid of $500 a year to the laboratory, the city defraying the remainder of the director's salary and the expense of housing and upkeep.

Personal.—Dr. John W. Coon, Waukesha, has purchased a controlling interest in the River Pines Sanatorium, Stevens Point, and will assume immediate charge.——Dr. B. L. Williams has succeeded Dr. Frank Brockway, Oshkosh, as superintendent of the Wisconsin Tuberculosis Sanatorium, Wales.——Dr. Jacob Lang was the guest of honor of the Milwaukee Medical Society, December 14, when the semicentenary of his entrance into practice in Milwaukee was celebrated.——Dr. William E. Buschman, Milwaukee, is said to be seriously ill with cerebral hemorrhage.——Dr. John R. McDill, Milwaukee, chief surgeon of the American Physicians' Expedition and on duty at Grandez, West Prussia, has been appointed inspector of fortress hospitals.——Dr. Paul Withington, Madison, has been appointed coach of the Wisconsin University football team.

CANADA

Health Officers to Meet.—The Ontario Health Officers' Association will hold its annual meeting in Toronto, May 29 and 30.

Personal.—Capt. E. Stanley Ryerson, who has been with the University of Toronto Base Hospital at Saloniki, has returned to Toronto on a short leave of absence.——Col. James A. Roberts of the University of Toronto Base Hospital has arrived in England from Saloniki. It is reported that the University Hospital will probably be withdrawn from Saloniki, as many of the men have suffered severely in health.——Dr. Walter W. Chipman, Montreal, has been appointed medical inspector of military hospitals throughout Canada.

Hospital News.—Canadian soldiers are now being sent home from England for active hospital treatment, and not merely for convalescent hospital treatment, thus necessitating large additional accommodation.——At Montreal eighty beds are being provided in the Royal Victoria Hospital; 300 in the Grey Nunnery; at Ottawa, eighty beds in St. Luke's Hospital; at Kingston, 600 in the Queen's University Building; at Winnipeg, 100 in the General Hospital; at Edmonton, 150 in Strathcona Hospital, and at Vancouver, 300 in the General Hospital.——For convalescent Canadian soldiers, the hospital commission has secured the Loyola Building in Montreal, which will accommodate 200 patients; the Rest Haven Building, Vancouver Island, B. C., 200; the Spadina at Toronto, 230, and the Ontario Military Hospital at Coburg, for 150 neurasthenic patients.——The Central Prison at Guelph, Ont., is to provide accommodation for 500 returned soldiers.——The Canadian accommodation for military tuberculous patients is now as follows: Kingston, 175; Hamilton, 175; London, 110; Frank, Alberta, 60; Kitchener, Ont., 30, and Sunny View, Kamloops, B. C., 20. New buildings are being provided at Kingston, Hamilton and London, Ont.——Surgeon General Kendall of the Gravenhurst Sanatorium has been put in charge of training physical instructors in Toronto so that every convalescent hospital in Canada will have a physical instructor.——A handbook for soldiers suffering from tuberculosis has been issued by the Canadian Military Hospitals Commission. It was written by Lieut. John R. Byers, M.D., in charge of the two sanatoriums at Ste. Agathe, Que. A copy has been sent to every Canadian soldier in Canada and overseas.——Mr. S. A. Armstrong, deputy provincial secretary for Ontario, has been placed in charge of organization and supervision of hospitals under the Canadian Hospitals Commission.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced:

Episcopal Hospital, Philadelphia, $500; Presbyterian Hospital, $2,000, and Methodist Hospital, $1,000, by the will of Martha L. Binder, Philadelphia.

Chester Hospital, Viscose Company of Marcus Hook and its employees, a contribution of $1,523.65.

Homeopathic Hospital, Chester County, a donation of $20,000 from Mr. Pierre S. DuPont, contingent on the raising of an additional $30,000.

German Hospital, Philadelphia, $5,000, by the will of Otto C. Wolf.

Medical Education in Chicago.—The subscription of the $5,300,000 for the development of higher medical education in Chicago, in accordance with the plans announced in THE JOURNAL, Nov. 18, 1916, is nearing completion. The following list shows the contributions so far made for this purpose:

General Education Board	$1,000,000
Rockefeller Foundation	1,000,000
Mr. and Mrs. Julius Rosenwald	500,000
F. H. Rawson	300,000
Martin Ryerson	250,000
J. Ogden Armour	200,000
Billings family for Albert M. Billings Memorial Hospital (C. K. G. Billings, Albert Billings Ruddock, Charles H. Ruddock and Dr. Frank Billings)	1,000,000
Mrs. Gustavus Swift	100,000
Charles Swift	100,000
Dr. Norman Bridge	100,000
Three anonymous contributions of $100,000 each and one of $50,000	350,000
Mrs. Edward Morris	50,000
A. D. Thompson, Duluth (James Nevins Hyde Memorial)	25,000
Charles F. Grey	20,000
Robert L. Scott	5,000

This makes a total of $5,000,000, and leaves $300,000 to be raised. The Albert M. Billings Hospital will be built on the Midway, and will consist of a $1,000,000 building containing 250 beds which will be utilized for teaching and clinical study. It will have an endowment of $3,000,000. The entire teaching force of the undergraduate medical school on the Midway, including the clinical departments of the Billings Memorial Hospital, will be full time salaried men. The F. H. Rawson gift of $300,000 will be used to erect a laboratory building for the graduate school, on the site of the present Rush Medical College Building. In the graduate school, the heads of the departments of medicine, surgery and obstetrics and all the laboratory men will be whole time salaried instructors. Promises already made practically complete the $8,000,000 required. The organization and administrative details will be worked out later.

Martin I. Wilbert—An Appreciation.—The following has been unanimously adopted by the members of the Council on Pharmacy and Chemistry. W. A. PUCKNER, Secretary.

The death of Martin Inventius Wilbert, a member of the Council on Pharmacy and Chemistry of the American Medical

Association since its organization, removes one of its most able and loyal members. He was possessed of an intellectuality and a manhood which commanded the attention and respect of the members of both the medical and the pharmaceutical professions. He was fearless, honest and unselfish. He was uncompromising in his denunciation of the evils which beset the practice of medicine and pharmacy, but was never ungracious either with his pen or in his speech. If after due deliberation he was sure that a definite policy should be promulgated to improve the conditions of these professions, he proclaimed his view and conducted a campaign that inevitably received the support and recognition of those best informed. He gave a life of service with never a thought of reward and earned every honor which was bestowed on him. His knowledge of pharmacy was such that he could have obtained prominence in the manufacturing field and with it would have come a large measure of financial reward. But he chose to devote his thoughts and energies to the general good rather than to his own profit. His influence on medicine and pharmacy was unique. The forcefulness of his personality was equaled only by his modesty and sincerity. His greatest work—one which will be cherished as a part of the history of the American Medical Association—was his devotion to the aims and objects of the Council on Pharmacy and Chemistry and his unselfish and indefatigable labors in its behalf.

We, the members of the Council on Pharmacy and Chemistry of the American Medical Association, mourn the loss of one of our most useful associates, and one whose life may be held up to the younger generation of pharmacists as an example of unselfishness and devotion to high ideals.

FOREIGN

Poliomyelitis in South America.—Advices from Montevideo, Uruguay, state that twenty-four cases of infantile paralysis have been reported in that city.

Medical Society for Mechanotherapy.—At Berlin has been recently founded the Aerztliche Gesellschaft für Mechanotherapie. The board consists of Schütz, Berlin; Hasebroek, Hamburg; Egloff, Stuttgart; Hirsch, Salzschlirf; Lubinus, Kiel, and Jacob, Posen.

Typhoid at Lisbon.—There has been a sudden outbreak of typhoid at Lisbon, 236 patients having been admitted to hospitals in two weeks. It is estimated that there were 639 cases throughout the city. In the 1912 epidemic there were 1,023 patients admitted to the hospitals in one week. In that epidemic the mortality was 9.7 per cent. The drinking water is probably responsible for the epidemic.

Pasteur Institute at Florence, Italy.—The report of the P. Grocco Institute for the four years ending with 1915 shows that 1,947 persons applied for treatment and that 1,336 were given the antirabic course. The highest number of applicants in any month was in April, with 132, and the lowest in February, with sixty-eight. Of those given treatment ninety-seven had been bitten by cats, 1,109 by dogs and twenty-three by pigs. The total mortality was 0.48 per cent., and since the foundation of the institute, 0.29 per cent. The reduced mortality for this entire period has been 0.092 per cent.

Prizes Awarded by the Academy of Medicine at Paris.—The Académie de Médecine had thirty-seven prizes to distribute at its annual meeting in December, but more than one third could not be awarded, as no suitable articles had been received in competition. One prize was given to J. Glover of Paris for his research on what he calls the *voix solidienne*, in contrast to the *voix aérienne*. By this he means the vibrations which the different tissues, at the moment of the emission of the voice, conduct to the entire surface of the body, even to the hands and feet. He has devised means to collect transmit, measure and record these vibrations. He includes respiratory and cardiovascular movements as well as vocal vibrations. . . . The prize for historical research was awarded to E. Wickersheimer, who has been editing the annual reports of the medical department of the University of Paris. The faculté de médecine dates from the thirteenth century; its first known records bear the date of 1267. The earliest reports are lost, but from November, 1395 to 1786, they have been preserved intact, and form twenty-four folio parchment volumes written by hand in Latin. These Wickersheimer has edited and published, down to 1516, in a quarto volume of 561 pages.——Another prize went to Maillard for his synthetic production of polypeptids by submitting amino acids to the action of glycerin. The *Bulletin* of the Académie, No. 49, gives the list and conditions for the numerous prizes open to competition in 1917, 1918 and 1919.

PARIS LETTER

PARIS, Dec. 21, 1916.

The War

TRENCH FOOT

The directors of the health service at the main army headquarters have sent to the hospitals a paper by Drs. Raymond and Parisot on freezing of the feet, commonly called trench foot. It states that this affection is particularly grave among the Indian troops, a number of whom are afflicted not only with serious and extensive local lesions, but also with symptoms of a general septicemia, accompanied by thermal blisters, adynamia, frequent epistaxis, and sometimes by collapse. At the outset, this condition may resemble typhoid, subsequently developing into a serious icteric state, pulmonary congestion or nephritis. These complications may result fatally, the necropsy in such cases revealing impairment of the liver, spleen, lungs and kidneys, and organic mycosis. Inoculation of animals with the bile taken from these patients under aseptic conditions produces the blister and eschar characteristic of trench foot. This septicemic condition, as observed in the Indian troops, is also found in Europeans in serious cases. Raymond and Parisot have succeeded in overcoming the disease among French soldiers without loss of toes by employing the following treatment:

1. The feet are bathed in lukewarm water with ordinary and borated camphor soap; the suds must be mild so as not to irritate the foot. The nails should also be manicured, care being taken not to injure the toes.

2. A dressing well moistened with borated camphor solution is applied. This dressing is made by applying loosely to the foot, taking care to include the nails, a layer of absorbent cotton about an inch thick, wrapped in gauze, and soaked in a solution of borated camphor. Over this is placed an ample covering of adhesive tape, and the entire dressing is stabilized with a band. Caution must be used not to bind the foot in any way. This dressing should remain moist until the next day, when it is removed. It is necessary to renew the dressing daily until the edema has totally disappeared, which usually occurs between the second and fourth day, when the impermeable dressing is discontinued for a day or two. Treatment is then limited to daily unctions of camphorated oil until a cure is effected. Camphorated alcohol, which is undesirable in such cases, should be avoided.

3. If the blisters are no larger than 2 centimeters, they can be left unopened as they heal with the treatment of the edema. Larger, or hemorrhagic, blisters should be aseptically excised, the underlying skin removed, and the blisters then dressed with compresses saturated with a solution of 30 gm. of camphor in 1,000 gm. of ether. The usual dressing is employed until all traces of edema have disappeared; it is then followed by a camphorated ether dressing.

4. In serious cases accompanied by fever, it is advisable to inject camphorated oil hypodermically in doses of from 5 to 10 c.c. daily.

5. As tetanus is to be particularly guarded against, it is well always to give a prophylactic injection to each patient. This injection should be repeated every eight days when ulceration develops, the dose being doubled in serious cases (Pasteur serum, 20 c.c., or American serum, 3,000 units).

6. Finally, it is important to apply the treatment early, transporting the patients to the nearest field hospitals, where they may receive immediate care. Under these conditions the average period of treatment is from twelve to fifteen days.

Transportation facilities have just been perfected whereby soldiers suffering with frozen feet may be brought from the front for prompt attention. Dr. Chavasse, general director of the health service of the army in the field, in transmitting the paper by Drs. Raymond and Parisot, emphasizes the great advantage in using the treatment described, the splendid results of which, as compared with those of other known methods, he has been able to appreciate.

EFFECT OF CRANIAL WOUNDS ON FITNESS FOR ARMY SERVICE

The fitness for army service of those who have received cranial wounds has been the subject of much discussion. At a meeting of the members of the neurologic society of Paris, and the representatives of the military neurologic centers (THE JOURNAL, July 1, 1916, p. 47, and July 22, 1916, p. 297), the problem was discussed, and the decisions then made have just been adopted by the undersecretary of state of the military health service. It has been decided to exclude from the service those with cranial wounds who are affected with serious organic disorders of the nervous system manifestly incompatible with any kind of military service (such as

hemiplegia, monoplegia, difficulty of speech, loss of a large part of the skull, etc.). It is also necessary in each case to search carefully for a certain number of other disorders which are of considerable importance from a prognostic point of view, such as chronic cephalalgia, dizziness, vertigo, aural and visual trouble, mental derangements, emotional, sympathetic, circulatory, secretory reactions, and finally hyperalbuminosis of the cerebrospinal fluid, etc. As to the manner of dealing with those afflicted with any of these disorders, it is difficult and undesirable to establish any arbitrary rule. In fact, the peculiarities of each case should be considered separately. In general, however, no soldier who has received a cranial wound should return to the front except in markedly exceptional cases and after prolonged observation.

LONDON LETTER

LONDON, Dec. 23, 1916.

The War

DISABLED SOLDIERS

The report of a committee of the Royal Colleges of Physicians and Surgeons on the medical treatment of dischargeable disabled soldiers has just been issued. It deals only with soldiers not yet discharged from the army. The case of soldiers already discharged is now under consideration and will form the subject of a further report. The committee has agreed to the following conclusions: 1. A considerable proportion of disabled soldiers require continued institutional treatment. 2. An essential condition of success is that the patient be throughout under discipline and that no form of discipline can adequately replace military discipline. 3. Consequently a disabled soldier should not be discharged from the army until a specially constituted board of medical experts has decided that no further institutional treatment will improve his condition, provided such treatment does not extend beyond some general maximum limit to be determined by the military authorities. 4. They should be retained in military hospitals until they are fit to be discharged to convalescent camps or other suitable institutions, or to return to their own homes. 5. On their discharge from military hospitals, such of them as are likely to benefit by institutional treatment should be transferred to annexes to the existing convalescent camps, or to such other camps as may be set up, officered by members of the army medical corps, to whom civilian help should be supplied. 6. In the camps their treatment should be, as far as possible, the same as that of soldiers who are expected to return to active duty, except that curative manual treatment, including technical and mechanical training should, in many cases, take the place of military exercises. 7. Several kinds of special boards will be necessary: (*a*) For general cases, the board should consist of one physician, one surgeon and a third officer; (*b*) for ophthalmic cases, one physician, one ophthalmic surgeon and a third officer; (*c*) for neurasthenic cases and epileptic cases, one physician, one neurologist and a third officer, and (*d*) for mental cases, one physician, one alienist and a third officer.

A STATE MEDICAL SERVICE

I have stated before that from the insurance act a state medical service in which the physicians would be whole time state officials would probably develop. For some time a controversy has been going on in the *Times* and in medical journals on the subject, and the war has provided the advocates of a state service with a new argument. The attempts to conserve the practices of the large number of physicians (practically every one up to the age of 41) who have joined the army have not been very successful. It was arranged that their neighbors would attend their patients for them and retain only a proportion of the fees, but the practices have shown a constant dwindling with the protraction of the war. Consequently a fund has been opened to which the profession is invited to subscribe for the purpose of lending money to physicians on their return from the war to buy practices. Then in the lay press attention was called to the exceedingly efficient army medical organization for the treatment of all the diseases and injuries of the soldiers, and the question was raised why the state should not organize in civil life an equally efficient system for the civilian population. It was pointed out that the physicians who had joined the army were thoroughly trained in this system and would be able to place their experience at the services of the public. Moreover, the giving of state appointments would be a far better way of recognizing their patriotism than the suggested loan fund. Curiously this further development of socialism has been strongly advocated in the *Times* which, like the rest of the conservative press, at the time of its passage offered the most virulent opposition to the insurance act. In these days, when the necessity for the state controlling almost all the activities of life is undisputed, the cry of socialism which confronted all social reforms, good or bad, has been silenced. On the other hand, what remains of the civilian medical profession is strongly opposed to the proposal, and the British Medical Association has condemned it. The association has exposed itself to the taunt of having done so before any details were brought forward. The panel physicians are also opposed to the proposal, and their organization is again considering the advisability of forming a trade union so as more effectively to protect their interests in this as well as in other respects.

Epidemic of Influenza in London

A widespread epidemic of influenza is prevailing in London. It is of a mild type, however, and manifests itself only by slight fever and general aching lasting only a few days and attended by very little or no catarrh of the respiratory mucous membrane. In the last four weeks the deaths from the disease have numbered only 17, 41, 55, and 81, respectively.

The Fallibility of Dying Declarations

According to the law of this country, the declaration of a person who is dying, and knows the fact, is admitted in the courts as evidence of equal value to that given on oath, and such evidence has often been the means of convicting criminals. That it is not always reliable is shown by the following case: A woman was dying as the result of an illegal operation for abortion. She made three separate "dying declarations," which were admissible, therefore, as evidence. They showed minor variations, but substantially agreed in attributing to a physician two unsuccessful attempts to induce abortion followed by a successful and fatal attempt by a woman. Fortunately the physician kept his books in good order, and by means of them was able to show that the woman had seen him only once, when she gave a false name, paid him 4 shillings and received from him a prescription for a tonic. According to his evidence she requested him to undertake an illegal operation which he refused. He was therefore vindicated. Presumably the fear of death was not sufficient to deter the woman from making a false accusation. A motive which has been suggested was the desire for revenge because the physician refused her request. Another possibility is that she was under some delusion in the matter.

Marriages

JOHN MARSHALL PAGE, M.D., Littleton, N. H., to Miss Agnes L. Greene of Cambridge, Mass., at Alston, Mass., December 24.

ROBERT GARFIELD PEARSON, M.D., Sacramento, Calif., to Miss Margaret E. Crawford of Philadelphia, at Sacramento, November 9.

STEPHEN DECATUR HARRISON, M.D., Brooklyn, to Miss Louise Hunter of Cornwall-on-Hudson, N. Y., at Brooklyn, December 28.

WILLIAM BARNARD SHARP, M.D., Shanghai, China, to Miss Alice Percy of Anaconda, Mont., at Helena, December 22.

CHARLES CHAPIN CHILDS, M.D., Niagara Falls, N. Y., to Miss Eva Saunders of Baltimore, December 20.

ARNOLD NOBLE ALLEN, M.D., Boston, to Miss Blanche A. Greenaway of Roslindale, Mass., December 23.

EDWARD GILES MCCONNELL, M.D., to Miss Elizabeth M. Scott, both of San Francisco, December 26.

ORVILLE JACKSON WALKER, M.D., Oklahoma City, to Miss Mary Getty of Wilmington, Pa., recently.

THOMAS ABRAM BOGER, M.D., Milwaukee, to Miss Camille Collins of Waukesha, Wis., December 20.

W. HARMAN EVANS, M.D., to Miss Agnes Irene McGregor, both of Lynchburg, Va., December 24.

ELMER WALKER BARRON, M.D., Boston, to Miss Ruth Stanwood Patch of Malden, December 25.

BENJAMIN F. STURGIS, JR., M.D., to Mrs. E. Janet Sherry, both of Salem, Mass., December 25.

LUCKY FRED LUNDY, M.D., Seattle, Wash., to Miss Ruby Leedom of Omaha, December 23.

Deaths

Hamilton Wright, M.D., Washington, D. C.; McGill University, Montreal, 1895; aged 49; died at his home in Washington, D. C., January 9. Dr. Wright is probably best known as one under whose guiding hand the Harrison Narcotic Law and other federal legislation for the regulation of the sale of habit-forming drugs developed and became laws. He had, however, an international reputation even before he entered on that work, having served from 1899 to 1903 as assistant director of the London County (England) laboratories, during which time he was sent by the British government to the Malay states to study beriberi and other tropical diseases. While engaged on this mission he founded the Institute for Medical Research in the Federated Malay States and Straits Settlements. In 1909 he was appointed by President Roosevelt as one of the United States Commissioners to attend the International Opium Convention in Shanghai. Later he was retained by the Department of State to take charge of affairs growing out of that convention, and served as one of the United States delegates to the international opium conferences, held at the Hague in 1911 and 1913. In 1915, Dr. Wright went to France to assist in relief work, and while there was seriously injured in a motor accident, from which he never fully recovered. His death, however, was the result of pneumonia.

Tarleton Hoffman Bean, M.D., Smithtown Branch, N. Y.; George Washington University, Washington, D. C., 1876; aged 70; a veteran of the Civil War; assistant in charge of the Division of Fish Culture and Curator of the Department of Fishes in the United States National Museum from 1880 to 1895; director of the New York Aquarium from 1895 to 1898, and since 1906 state fish culturist; an honorary member of the Danish Fishery Society; editor of the *Proceedings and Bulletin of the United States National Museum* from 1878 to 1886; president of the American Fisheries Society in 1908 and 1909; a scientist of great renown in his specialty; who had received decorations from France, Germany and Japan; died in Albany, December 28, as the result of injuries sustained in an automobile accident two months before.

Samuel Anderson McWilliams, M.D., Chicago; Northwestern University Medical School, 1866; aged 81; a Fellow of the American Medical Associatioon; formerly lecturer on urinary and renal disorders in his alma mater and later professor of anatomy in the Northwestern University Woman's Medical School; one of the organizers of the College of Physicians and Surgeons, Chicago, and later one of the founders of the Chicago Hospital College of Medicine; professor of diseases of the chest, clinical medicine and physiology in Reliance Medical College, Chicago; a specialist in physical diagnosis; died at his home, January 4, from arteriosclerosis.

Charles Henry Rice, M.D., Fitchburg, Mass.; Harvard Medical School, 1866; aged 73; formerly a Fellow of the American Medical Association; a member and once vice president of the Massachusetts Medical Society; consulting surgeon to the Burbank Hospital, Fitchburg; formerly major surgeon of the Sixth Infantry, Massachusetts Volunteer Militia, and retired in 1897 as lieutenant colonel; first city physician of Fitchburg and first chairman of the board of health; for twenty-five years a member of the board of trustees of the public library, and for sixteen years a member of the school board; died at his home, January 5.

DeWitt A. Paine, M.D., Eugene, Ore.; Hospital College of Medicine, Louisville, Ky., 1887; aged 63; formerly a Fellow of the American Medical Association and president of the Lane County Medical Society; president of the Eugene Loan and Savings Bank and of the United States National Bank, Eugene; consulting surgeon for the Southern Pacific Railroad; superintendent of the Oregon Insane Asylum from 1895 to 1901; died suddenly at his home from cerebral hemorrhage, December 27.

William Wallace Rodman, M.D., Pierce City, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1875; aged 62; formerly a Fellow of the American Medical Association; a member of the Missouri State Medical Association, and Association of Military Surgeons of the United States; formerly major surgeon of the Second Infantry, Missouri National Guard; died in Kansas City, Kan., December 19, from cerebral hemorrhage.

Jesse Houck Ramsburgh, M.D., Washington, D. C.; University of Virginia, Charlottesville, 1895; aged 47; a Fellow of the American Medical Association; a member of the faculty of Georgetown University Medical College; a member of the staff of Georgetown University Hospital; chief of clinic of the Free Dispensary for Consumptives; prominently identified with the tuberculosis movement in the district; died in the Emergency Hospital, Washington, January 2, from cerebral hemorrhage.

Edward Boicourt Trovillion, M.D., Boulder, Colo.; Rush Medical College, 1885; aged 55; a Fellow of the American Medical Association and president of the Boulder County Medical Society in 1912; for several years professor of anatomy in the University of Colorado; health officer of Boulder County for five years; died in the University Hospital, Boulder, December 23, from tumor in the head of the pancreas and cirrhosis of the liver.

Hulbert H. Clark, M.D., Santa Cruz, Calif.; Medical College of Ohio, Cincinnati, 1871; aged 81; formerly a Fellow of the American Medical Association; acting assistant surgeon, U. S. Army, during the Civil War; formerly local surgeon of the Chicago and Eastern Illinois Railroad; coroner and public administrator of Santa Cruz County from 1894 to 1898, and in 1896 mayor of Santa Cruz; died at his home, December 26.

Henry H. Amos, M.D., Charles City, Iowa; King Eclectic Medical College, Des Moines, Iowa, 1888; aged 58; formerly a Fellow of the American Medical Association, and president of the Floyd County Medical Society; a specialist on diseases of the eye, ear, nose and throat; local surgeon to the Chicago, Milwaukee and St. Paul Railroad; died suddenly in a drug store in Charles City, December 19, from heart disease.

William E. Whitney, M.D., Eldora, Iowa; Rush Medical College, 1891; aged 61; a Fellow of the American Medical Association; surgeon to the Iowa State Industrial School, boys' department, and assistant superintendent of the institution; at one time superintendent of the Orphan's Home, Davenport, and also deputy sheriff of Hardin County; died at his home, January 3, from cerebral hemorrhage.

Joseph Weatherhead Warren, M.D., Harrisburg, Pa.; University of Bonn, Germany, 1880; aged 67; assistant to the state commissioner of health; demonstrator of anatomy and instructor in Harvard Medical School from 1881 to 1891, and from 1891 to 1913 professor of physiology in Bryn Mawr College; died in Keystone Hospital, Harrisburg, December 20, from disease of the kidney.

Jean J. Dumortier, M.D., South Norwalk, Conn.; University of Ghent, Belgium, 1890; aged 51; a Fellow of the American Medical Association; a member of the staff and president of the Norwalk Hospital; once health officer of South Norwalk; was found dead at his home, December 13, having taken his life by strangulation while of unsound mind on account of ill health.

Frank M. Galer, M.D., Degraff, Ohio; Starling Medical College, Columbus, Ohio, 1867; aged 73; a member of the Ohio State Medical Association; president of the Citizens' Bank, Degraff, and vice president of the United Telephone Company; a member of the city council and board of education of Degraff; died at his home, January 1, from kidney disease.

Paul Monroe Pilcher, M.D., Brooklyn; College of Physicians and Surgeons in the City of New York, 1900; aged 40; a Fellow of the American Medical Association, and a specialist in abdominal surgery; consulting surgeon to the East Long Island Hospital; first editor of the *Long Island Medical Journal;* died at his home, January 4, from pneumonia.

Peter John Livingstone, M.D., Detroit; University of Michigan, 1892; aged 51; a Fellow of the American Medical Association; a member of the American Academy of Ophthalmology and Oto-Laryngology; a specialist on diseases of the eye, ear, nose and throat; died at his home, December 28, from cerebral hemorrhage.

George W. Grabenstatter, M.D., Buffalo; University of Buffalo, 1900; aged 42; a Fellow of the American Medical Association; for two years acting assistant surgeon, U. S. Army, with service in the Philippine Islands; died at the Buffalo General Hospital, January 3, nine days after an operation for appendicitis.

Charles Michael McLaughlin, M.D., Greencastle, Pa.; Jefferson Medical College, 1889; aged 55; a Fellow of the American Medical Association; and once president of the Cumberland Valley Medical Association; a member of the board of health of Greencastle; died at his home, January 6, from chronic endocarditis.

Joseph A. E. Reed, M.D., Lancaster, Pa.; Pennsylvania Medical College, Gettysburg, Pa., 1854; aged 84; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; a surgeon of volunteers throughout the Civil War; died at his home, January 3.

Frederick W. Fochtman, M.D., Cumberland, Md.; College of Physicians and Surgeons, Baltimore, 1889; aged 49; a Fellow of the American Medical Association; a pioneer Roentgen-ray operator of western Maryland; was found dead in his automobile at Ellerslie, January 5, from cerebral hemorrhage.

William F. Ingram, Kaysville, Utah (license, five years' practice, Utah, 1894); aged 76; formerly a member of the Utah State Medical Association; for more than forty years a practitioner of Davis County; a veteran of the Civil War; died at the home of his son in Bristol, R. I., December 7.

John Willard Meeker, M.D., Brooklyn; New York University, New York, 1863; aged 82; for forty years a druggist of Williamsburg, and for a time a surgeon in the army; a charter member of the New Jersey Microscopical Society; died at his home, January 1, from pneumonia.

John L. Hoshall, M.D., Oklahoma City; College of Physicians and Surgeons, Baltimore, 1899; aged 43; a member of the Oklahoma State Medical Association; was accidentally killed, January 4, by a collision between the automobile in which he was riding and another car.

Roy Gavin Fisher, M.D., Tucson, Ariz.; Dearborn Medical College, Chicago, 1907; College of Physicians and Surgeons, Chicago, 1909; aged 33; formerly professor of ophthalmology in the Chicago Eye, Ear, Nose and Throat College; died at a hospital in Tucson, December 26.

Harry Blair Warriner, M.D., Philadelphia; Maryland Medical College, Baltimore, 1912; Hahnemann Medical College, Philadelphia, 1914; aged 28; chief resident physician at the Children's Homeopathic Hospital; died in that institution, January 4, from pneumonia.

George Everett Titus, M.D., Hightstown, N. J.; Bellevue Hospital Medical College, 1877; aged 61; a Fellow of the American Medical Association; at one time a member of the common council of Hightstown; died at his home, January 4, from cerebral hemorrhage.

George Clary, M.D., New Britain, Conn.; Yale University, New Haven, Conn., 1857; aged 87; a member of the Connecticut State Medical Society; surgeon of the Thirteenth Connecticut Volunteer Infantry during the Civil War; died at his home, December 30.

Elias L. Kinyon, M.D., Brighton, Colo.; Eclectic Medical Institute, Cincinnati, 1899; aged 52; died at his home, January 4, from the effects of a gunshot wound of the head, self-inflicted, it is believed, with suicidal intent, while despondent on account of ill health.

Ernest Samuel Feagin, M.D., Mobile, Ala.; University of Alabama, Mobile, 1903; aged 35; a member of the Medical Association of the State of Alabama; for five years house physician of the City Hospital, Mobile; died suddenly at his home, December 30.

Albert Weeks, M.D., Phoenixville, Pa.; Jefferson Medical College, 1880; aged 58; formerly a Fellow of the American Medical Association; one of the organizers of the Stratford Castle Hospital, Phoenixville; died at his home, December 27, from erysipelas.

Edmund T. Spotswood, M.D., Terre Haute, Ind.; Rush Medical College, 1851; aged 90; surgeon of the Seventy-First Indiana Volunteer Infantry during the Civil War; a member of the legislature in 1858; died at his home, January 5, from senile debility.

Alphonse Louis Eakin, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1863; aged 77; died at his home, January 2, after an invalidism of several years, due to a wound received while serving as a medical officer in the Civil War.

John S. Sellers, M.D., Hartford City, Ind.; Medical College of Indiana, Indianapolis, 1888; aged 72; formerly a Fellow of the American Medical Association and a member of the Indiana State Medical Association; died at his home, January 3.

Carl Shadiker Adams, M.D., Colorado Springs, Colo.; Harvard Medical School, Boston, 1902; aged 42; a specialist on dermatology; a member of the Colorado State Medical Society; died at his home, about January 1, from tuberculosis.

William Clarence Kluttz, M.D., El Paso, Texas; University of Pennsylvania, Philadelphia, 1899; aged 40; a Fellow of the American Medical Association, and a member of the American Association of Railway Surgeons; died, January 4.

Erich A. Hermsmeier, M.D., Milwaukee; College of Physicians and Surgeons, Memphis, Tenn., 1911; aged 28; a Fellow of the American Medical Association; died at his home, December 28, from pneumonia complicating influenza.

Kenton Harper Trimble, M.D., Monterey, Va.; University of Virginia, Charlottesville, 1884; Bellevue Hospital Medical College, 1885; aged 57; a member of the Medical Society of Virginia; died at his home, December 22.

John T. Fugate, M.D., Urbana, Ill.; Missouri Medical College, St. Louis, 1859; aged 86; one of the oldest practitioners of central Illinois; died at the home of his daughter in Urbana, December 25, from senile debility.

Richard Edward Sweeney, M.D., New York; Niagara University, Buffalo, 1898; aged 39; died in the Gouverneur Hospital, New York, December 25, from burns sustained by the accidental upsetting of an oil stove.

Charles Cleveland Frederick, M.D., Lizella, Ga.; Medical College of Georgia, Augusta, 1912; aged 29; a member of the Medical Association of Georgia; died at the home of his sister in Macon, about December 21.

James Bingham, M.D., Washington, Pa.; Western Reserve University, Cleveland, 1868; aged 84; for forty-two years a practitioner of Clinton, Pa.; died at the home of his daughter in Washington, Pa., December 25.

Benjamin Franklin Hopkins, M.D., Hot Springs, Va.; Jefferson Medical College, 1855; aged 88; a member of the Medical Society of Virginia; died at the home of his daughter in Staunton, Va., December 26.

Erastus H. Cummings, M.D., Grand Rapids, Mich.; Hahnemann Medical College, Chicago, 1877; aged 81; a veteran of the Civil War, in which he served as a hospital steward; died at his home, December 20.

Charles Edwin Stone, M.D., Lynn, Mass.; University of Vermont, Burlington, 1906; aged 48; a member of the Massachusetts Medical Society; died in the Lynn Hospital, November 5, from chronic nephritis.

Sarah Abbie Jenness, M.D., Wolfeboro, N. H.; Boston University, 1889; aged 70; for many years a practitioner of Boston; was burned to death in a fire which destroyed her home, December 26.

Wilson L. Kutz, M.D., Weissport, Pa.; Jefferson Medical College, 1878; aged 62; a Fellow of the American Medical Association; died at his home, December 23, from malignant disease.

Ellera J. Whittleton, M.D., Webster, N. Y.; Homeopathic Hospital College, Cleveland, 1884; aged 57; died at his home, November 20; from cerebral hemorrhage.

Francis Lamb Howland, M.D., Huntsville, Ont.; McGill University, Montreal, 1867; aged 74; died at his home, November 8, from chronic nephritis.

Russell Henry Nevins, M.D., Waterford, Conn.; College of Physicians and Surgeons in the City of New York, 1876; died in New York, December 21.

James Kiron Dorsey, M.D., Wichita, Kan.; New York University, New York, 1892; aged 46; died at his home, December 24, from pneumonia.

James Harry Ralston, M.D., Kansas City, Mo.; Medico-Chirurgical College of Kansas City, 1904; aged 45; died at his home, about December 29.

Richard Edward Cavanaugh, M.D., Duluth, Minn.; Rush Medical College, 1894; aged 48; died at his home, December 24, from heart disease.

William Ferdinand Radue, M.D., Union Hill, N. J.; New York University, New York, 1888; aged 55; died at his home, December 26.

Charles E. Caldwell, M.D., Chicago; Rush Medical College, 1877; aged 65; died at his home, January 5, from pneumonia.

Sarah J. Millsop, M.D., San Diego, Calif.; Hahnemann Medical College, Chicago, 1886; died at her home, November 2.

John Becker, M.D., Chicago; Rush Medical College, 1865; aged 87; died at his home, December 29, from tuberculosis.

Edwin Mayo Bangs, M.D., Ithaca, N. Y.; Boston University School of Medicine, 1878; died at his home, December 24.

Alexander Gaertner, M.D., Boston; University of Jurjev, Russia, 1889; aged 56; died at his home, December 30.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

ASPIRIN

Report of the Council on Pharmacy and Chemistry

The referee's report on Aspirin-Bayer which follows was submitted to the Council and adopted by it and, in accordance with the referee's recommendation, was sent to the Bayer Company, Inc. The company's reply contained nothing to warrant the continued recognition of this product by the Council. It was accordingly directed that Aspirin-Bayer be omitted from New and Nonofficial Remedies.

W. A. PUCKNER, Secretary.

REFEREE'S REPORT

The referee's attention has been called to the systematic campaign of advertising aspirin to the public. He is informed that tablets have been marketed for some time in "vest-pocket" boxes, bearing the name "Aspirin" permanently affixed, which is in technical conflict with the Council's rule against indirect advertising to the public. More recently, conspicuous advertisements have appeared in daily papers. These are technically in conflict with the rule against direct advertising to the public.

In addition to the plain technical conflicts with the Council's rules there is a feature of the case which has not hitherto been raised and which should be fully considered: It may be remarked that the advertisements contain no therapeutic recommendation, and do not, on their face, urge the public to employ aspirin but apparently merely tell the public how it may protect itself against sophistication. In substance, they say: "If you are a user of aspirin, this is how you may obtain the genuine." It might be said that this is not an attempt to increase the use or sale of aspirin—the ordinary object of advertising—but that the means of protection against adulteration is a "subject on which the public should be instructed." The principle of such exceptions is stated in the comments to Rule 3 (New and Nonofficial Remedies, 1916, p. 15); and although the present case does not come under the exceptions specified under these comments, it may be urged that the exceptions need to be increased as occasion arises. The notorious adulteration of aspirin may well be urged as establishing a need for a similar exception in its use.

The general principle of protecting the public against fraud, adulteration and substitution is directly in line with the objects of the Council, and deserves commendation and support. It is obvious, however, that the means adopted for this end must be efficient, that they must not open the door to other, perhaps greater evils and that they must be used in good faith. The policy of advertising "Aspirin-Bayer" must be examined in these respects.

In the first place, the acceptance of a product by the Council implies an agreement by the manufacturers or agents that they will adhere strictly to the Council's rules and will not depart from the letter or spirit of these rules without notice to the Council. This principle has been grossly infringed in the present case. There can be no doubt that the agents were aware that their advertisements conflicted, at least with the letter of Rule 3. Nevertheless, they did not, in any way, inform the Council of the change in policy. In this respect, at least, they have not acted in good faith.

Secondly, the wording of the advertisement implies that only the tablets stamped with "The Bayer Cross" are genuine. This is misleading, since every druggist has the right to make unstamped tablets of aspirin, fully as genuine as those stamped with the cross.

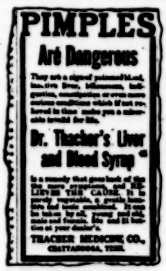
Thirdly, the cross itself cannot be considered an efficient protection; for people who imitate aspirin will not hesitate to imitate the stamp. The remedy, in either case, and as with any other drug, is the examination of trade samples, and the vigorous prosecution of those guilty of violating the law.

Fourthly, the permanent affixing of the name "Aspirin" to the vest-pocket boxes is also inefficient as a protection, and serves mainly as an advertisement.

Fifthly, whatever may have been the motives of the advertisers, and however carefully the advertisements are worded, they will inevitably tend to increase the use of aspirin by the public, and this is directly against the interests of public health. The public does not know, as physicians do, that headaches are merely symptoms of other, sometimes very serious conditions; and that they are often the signal for the need of a thorough physical examination and diagnosis. It is true that they are often also the symptoms of very minor derangements, which will right themselves spontaneously; and that, in such cases, drugs like aspirin may give relief and may do no harm. The patient, however, is not educated to distinguish one class from the other, and therefore anything that tends to promote the indiscriminate use of such remedies as aspirin is detrimental to the public health. Furthermore, aspirin itself is not always harmless. Alarming idiosyncrasies are sufficiently common that the use of the first doses, at least, should require medical supervision. With these considerations in mind, the referee is of the opinion that the direct and indirect advertising of aspirin is to be condemned.

MORE MISBRANDED NOSTRUMS

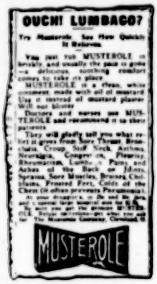
Dr. Thacher's Liver and Blood Syrup.—This preparation, which admittedly contained 12½ per cent. alcohol, was sold by the Thacher Medicine Company, Chattanooga, Tenn. The claims made by the company that the stuff contained no aloes but contained potassium iodid and sarsaparilla combined with May apple, gentian, juniper berries, buchu leaves, dandelion root and yellow dock root were declared by the government to be false and misleading. It was further claimed by the company that Thacher's Liver and Blood Syrup would "cure All Liver Complaints, Biliousness, Costiveness, Drowsiness, Yellow Jaundice, And All Liver Complaints, Impure or Bad Blood including Scrofula, Salt Rheum, Erysipelas, Pimples, and all Diseases of A Syphilitic Character, Also Loss of Appetite, Dyspepsia, Sour Stomach, Sleeplessness, Pains in Back and Sides, Sick Headache . . ." Naturally, the government declared these claims misleading, false and fraudulent. As no claimant appeared for the property, the court ordered that it should be destroyed by the United States marshal.—[*Notice of Judgment No. 4351*].



Black's Pulmonic Syrup.—W. F. Black and W. H. Martin, who did business under the name Black Distributing Agency, Nashville, Tenn., put on the market "Black's Pulmonic Syrup" which was alleged to contain 20 per cent. alcohol and to be "Compounded by W. F. Black, M.D., Birmingham, Alabama." It was sold as "The New Remedy for Tuberculosis and Bronchitis." Government chemists reported that it was a water-alcohol solution of ichthyol, glycerin and sugar. Government officials declared, naturally, that the claim that this stuff was an effective remedy for tuberculosis was false and fraudulent and applied knowingly, recklessly and wantonly. Both defendants pleaded guilty and Black was fined $200; Martin, $100, and the costs assessed on both.—[*Notice of Judgment No. 4357*].

Walker's Pain Destroyer.—This stuff was made and sold by Sarah Ann McDonald, who conducted her nostrum business under the name of Walker Medicine Co., St. Paul, Minn. It was sold as "a sure cure for Diphtheria and all Throat Diseases, Summer Complaint, Felons, Chilblains, Frost Bites, Neuralgia, and is remarkable in Rheumatism." The govern-

ment chemists reported that analysis "showed that the product was an alcoholic solution of oil of mustard, chloroform, opium and collodion." The therapeutic claims were declared by the government to be false and fraudulent and made knowingly and in reckless and wanton disregard of their truth or falsity. The further claim made for the stuff that it was "invaluable in the household and nursery and no danger whatever can ensue from an overdose, as there are no poisonous ingredients in the compound" was declared false and misleading in view of the fact that the stuff contained chloroform and opium. The defendant pleaded guilty and was fined $5.—[*Notice of Judgment No. 4353.*]



Musterole.—This product, marketed by the Musterole Co., Cleveland, Ohio, was analyzed by the government chemists who reported that it was essentially a mixture of lard or some similar material with oil of mustard, menthol and camphor. Claims made for the preparation were to the effect that it would cure pneumonia, asthma, bronchitis, croup, rheumatism and pleurisy and would prevent pneumonia. These claims were declared false and fraudulent and applied knowingly, recklessly and wantonly. The company would neither affirm nor deny the charge but was found guilty and fined $25 and costs.—[*Notice of Judgment No. 4358.*]

Snyder's Bitters.—The J. H. Snyder Medicine Co., Jonesboro, Ark., sold Snyder's Bitters under the claims that it contained 20 per cent. alcohol, and would eradicate "Scrofula, Scrofulous Humors, . . . Syphilitic Affections, Cancerous Humors, Ringworms, Salt Rheum . . . Catarrh . . . and all diseases arising from an impure state or low condition of the blood." It was also said to be an "Unfailing Relief for Indigestion and all Diseases of the Liver and Kidneys" as well as a cure for malaria, to say nothing of being "an absolute panacea for all diseases and disorders of the female genital organs." These claims were declared false and fraudulent and applied knowingly, recklessly and wantonly. The company pleaded guilty and was fined $10 and costs.—[*Notice of Judgment No. 4359*].

5 Drops.—"5 Drops" was put on the market by the Swanson Rheumatic Cure Co., Chicago, Ill. It was sold as a remedy for rheumatism, sciatica, asthma, hay fever, croup, la grippe, catarrh and malaria; as a preventive of germ diseases and as a cure for blood diseases, eczema, scrofula and gastric ulcer as well as a preventive of gallstones. The government chemists reported that analysis showed the stuff to consist of "a mixture of eucalyptol (or a eucalyptol-containing oil), camphor, safrol, terpineol and eugenol (or an oil containing those ingredients, such as camphor oil)." The government declared the curative claims to be false and fraudulent and applied knowingly, recklessly and wantonly. The company pleaded guilty and was fined $200 and costs.—[*Notice of Judgment No. 4372*].

Dr. Stuart's Specific Drops.—Joseph W. and Anna B. House sold "Dr. Stuart's Specific Drops" under the name Stuart Remedy Co., Detroit, Mich. Claims made for the nostrum were that it was a cure for rheumatism and a positive specific for eczema and salt rheum and would drive all impurities out of the blood. The government chemists reported that the preparation was essentially a mixture of camphor, alcohol, mercuric iodid and turpentine. The curative claims were declared false and fraudulent and applied knowingly, recklessly and wantonly. The defendants pleaded guilty and were fined $50.—[*Notice of Judgment No. 4368*].

Correspondence

Secret Remedies and Professional Responsibility

To the Editor:—A man of great wealth and of social and business prominence in this community recently returned from an eastern visit during which he had occasion to consult a physician. The physician, be it remarked, is a prominent educator, being dean of one of the most important medical schools of the country, a man of nation wide reputation, and of undoubted skill and ability as a practitioner of medicine. He is also well known in the Americal Medical Association, of which he has long been a prominent and important Fellow, and is a vigorous enemy of secret remedies and a strong supporter of the Council on Pharmacy and Chemistry. The above mentioned gentleman brought home with him a new and marvelous remedy which his physician had prescribed for him and which in an incredibly short time had cured his influenza and which, as grip was quite epidemic at home among his friends, he immediately recommended to several of them. There is no greater joy to the average nonmedical person than to be able to advise a new remedy for one's friends' ailments, especially one so highly recommended, and as a result there was an immediate and large demand for this preparation, greatly to the profit of the local drug stores as well as of the manufacturer. The remedy, a secret proprietary which has not been accepted by the Council and cannot be advertised in THE JOURNAL, is a preparation which has long been on the market, is freely sampled to physicians in an attractive container and accompanied by the usual extravagant claims to cure many of the common diseases, and is recommended both for internal and external use. This incident is related to show how sometimes our most ethical brethren help to boost the secret remedy.

BURNSIDE FOSTER, M.D., St. Paul.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

HEMATOXYLIN STAIN—DIAGNOSTIC VALUE OF VON PIRQUET REACTION

To the Editor:—In the April, 1916, issue of the *Comptes rendus des séances et mémoires de la Société de biologie*, Paris, Triboneau, Fichet and Dubriel describe a new hematoxylin stain—silver hemateinate. The abstract I have gives no details as to its preparation.

1. Please publish the detailed method of preparing this stain.

2. Please give briefly the exact diagnostic value of the von Pirquet test.

ROBERT KILDUFFE, M.D., Chester, Pa.

ANSWER.—1. (*a*) Preparation of Silver Oxid: In a carefully cleaned stoppered bottle dissolve 1 gm. of silver nitrate in 100 c.c. cold distilled water. Add to this quickly 50 c.c. of a 10 per cent. aqueous solution of pure potassium hydroxid. Shake well. Let stand for one minute; decant from the heavy precipitate of silver oxid. Wash this by decantation with four lots of 150 c.c. of distilled water, each. (*b*) Preparation of Silver Hemateinate: Dissolve 2.5 gm. of French hematoxylin in 50 c.c. of absolute alcohol. Pour this on the silver oxid. Place the mixture in a long-necked flask, and heat on the water bath with occasional shaking until the alcohol boils. The liquid should be of a deep orange color. Filter. (*c*) Preparation of Silver Hemalum Staining Solution: To one part of the silver hemateinate solution add twenty parts of a 5 per cent. solution of potassium alum.

2. It is not possible within the limits of a short answer to discuss satisfactorily the diagnostic value of von Pirquet's reaction. The following is a partial list of the literature on the subject published within the last two years:

Brown, E. M.: Diagnostic Value of Cutaneous Tuberculin Test in Recruiting, *U. S. Naval Med. Bull.*, July, 1914.

Kinghorn, H. M.: Comparative Value of von Pirquet and Subcutaneous Tuberculin Tests in Diagnosis of Tuberculosis in Adult, abstr., THE JOURNAL, July 25, 1914, p. 349.

Frehn, W.: Sensitization Index with Tuberculin Skin Reaction, *Beitr. z. Klin. d. Tuberk.*, July 30, 1914; abstr., THE JOURNAL, Jan. 2, 1915, p. 90.

Rogers, O. F., Jr.: Study of Children with Positive Skin Tuberculin Reactions, *Boston Med. and Surg. Jour.*, Feb. 4, 1915; abstr., THE JOURNAL, Feb. 20, 1916, p. 695.

Cattermole, G. H.: Tuberculin Tests in Children of Colorado, THE JOURNAL, Aug. 28, 1915, p. 782.

Von Litzner, M.: Detection of Focal Reaction after Tuberculin Test, *München. med. Wchnschr.*, Aug. 10, 1916; abstr., THE JOURNAL, Sept. 23, 1915, p. 1148.

Clovis, E. E.: Use of Tuberculin Reaction in Diagnosis of Pulmonary Tuberculosis, *West Virginia Med. Jour.*, February, 1916.

Shelter, H.: Intradermal Tuberculin Reaction in Diagnosis of Tuberculosis in Guinea-Pigs, *Deutsch. med. Wchnschr.*, Jan. 20, 1916; abstr., THE JOURNAL, March 11, 1916, p. 845.

Zitronblatt, A. Y.: Skin Tuberculin Test in Surgical Practice, *Russk. Vrach*, 1915, 14, No. 30, abstr., THE JOURNAL, March 11, 1916, p. 850.

REMOVAL OF BURNT POWDER FROM THE SKIN

To the Editor:—Please give me the best treatment for removing burnt powder from the skin, the result of a pistol shot.

W. H. SMITH, M.D., Goldsboro, N. C.

ANSWER.—A reply to this question appeared in Queries and Minor Notes, THE JOURNAL, Nov. 14, 1908, p. 1716. In brief, it was stated that if the patient is seen shortly after the accident, the gunpowder grains can be picked out readily. Much of the powder can be removed by the same process later on, although this is tedious and difficult. Watson and Keyes advocated the use of a cutaneous punch or trephine similar to that used for removing comedones. The punch is placed over the powder mark and pressed down firmly. Care should be taken not to enter the skin too deeply. The small portion of skin which projects from the trephine can be snipped off and a soothing ointment applied. Hydrogen peroxid is sometimes used, either full strength or three parts to one of glycerin. Crile applies hydrogen peroxid until it has penetrated under the powder grains, the effervescence forcing them out of their bed.

In case the powder marks are old, they may be removed in the same manner as tattoo marks. Methods of doing this are described by W. A. Pusey, "Principles and Practice of Dermatology," in the chapter on "Tattoo Marks and Powder Stains," p. 814, and also in Queries and Minor Notes, THE JOURNAL, July 22, 1911, p. 310; Sept. 12, 1912, p. 895, and Jan. 24, 1914, p. 315.

TREATMENT OF SEBORRHEA OF SCALP

To the Editor:—In my books on skin diseases I find no lotions for seborrhea of the scalp, except those containing resorcin. This is so scarce and high priced that I cannot use it. Could you give one or more formulas containing drugs that may be substituted for resorcin?

GEORGE G. SMITH, M.D., Chagrin Falls, Ohio.

ANSWER.—A good lotion for seborrhea of the scalp is the following:

	gm. or c.c.	
Mercuric chlorid	1	gr. vii
Chloral hydrate	15	ʒ ss
Perfumed spirit, N. F.	30	ʒ i
Water, sufficient to make	500	O i

This can be used on the scalp and hair daily or every other day. It is fully as effective as the resorcin solution, and much more agreeable to use. In conjunction with such a lotion, either in case of oily hair or of dandruff, it is well to use on the scalp occasionally an ointment like the following:

	gm. or c.c.	
Salicylic acid	1 to 2	gr. xx to xxx
Benzoic acid	3 to 4	gr. xl to lx
Precipitated sulphur	3 to 4	gr. xl to lx
Petrolatum	30	ʒ i

This is applied occasionally—once in four or five days to once in eight or ten days—and is followed by shampoo in from thirty-six to forty-eight hours.

REQUIREMENTS TO PRACTICE IN THE HAWAIIAN ISLANDS

To the Editor:—Please inform me as to the requirements for license to practice in the Hawaiian Islands.

JOIS MORITA, Baltimore.

ANSWER.—To obtain a license in Hawaii, the applicant must be a graduate of a reputable medical college having not less than four years of study, and must pass an examination in all the branches of the medical curriculum. There is no reciprocity. Examinations are held by appointment between the board and candidates. The examination fee is $10. Address Dr. W. L. Moore, secretary, Board of Medical Examiners, Boston Building, Honolulu.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ILLINOIS: Chicago, Jan. 24-26. Sec., Dr. C. St. Clair Drake, Capitol Bldg., Springfield.

IOWA: Des Moines, Feb. 6-8. Sec., Dr. G. H. Sumner, Capitol Bldg., Des Moines.

KANSAS: Topeka, Feb. 13. Sec., Dr. H. A. Dykes, Lebanon.

NEW YORK: New York City, Albany, Syracuse, and Buffalo, Jan. 29-Feb. 2. Chief, Examinations Division, H. H. Horner, University of the State of New York, Albany, N. Y.

VERMONT: Montpelier, Feb. 13. Sec., Dr. W. Scott Nay, Underhill.

District of Columbia October Report

Dr. Edgar P. Copeland, secretary of the Board of Medical Supervisors of the District of Columbia, reports the oral and written examination held at Washington, Oct. 10-12, 1916. The total number of subjects examined in was 16; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 15, of whom 10 passed and 5 failed. Three candidates were licensed through reciprocity. The following colleges were represented:

PASSED	Year Grad.	Per Cent.
George Washington University (1916) 77, 79.1, 79.4, 79.4, 80.1, 86.4, 86.6.		
University of Maryland	(1915)	78.6, 87
Temple University	(1915)	79.2
FAILED		
George Washington University	(1916)	71.4
Howard University	(1911)	66
College of Phys. and Surgs., Boston	(1916)	68
Temple University	(1915)	74
Meharry Medical College	(1916)	71.2

LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Georgetown University	(1908)	Maryland
Johns Hopkins University	(1911)	Penna.
Barnes Medical College	(1903)	W. Virginia

Colorado October Report

Dr. David A. Strickler, secretary of the Colorado State Board of Medical Examiners, reports the written examination held at Denver, Oct. 3, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 12, of whom 8 passed, including 1 osteopath, and four failed, including 1 osteopath. Eighteen candidates were licensed through reciprocity, and one osteopath was granted a reregistration certificate. The following colleges were represented:

PASSED	Year Grad.	Per Cent.
University of Colorado	(1911)	88.3
Chicago College of Medicine and Surgery	(1916)	82.5
Northwestern University	(1916)	87.4
Rush Medical College	(1915) 83.6; (1916)	85.4
Jefferson Medical College of Philadelphia	(1914)	84.3
University of Pennsylvania	(1915)	81.5
FAILED		
St. Louis College of Physicians and Surgeons	(1915)	63.7
John A. Creighton Medical College	(1907)	71.7
Lincoln Medical College	(1916)	67.9

LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Hering Medical College	(1904)	Illinois
College of Physicians and Surgeons, Chicago	(1901)	Iowa
Baltimore Medical College	(1906)	Georgia
Homeopathic Medical College of Missouri	(1895)	Missouri
University Medical College of Kansas City	(1908)	Kansas
Washington University	(1906) (1907)	Illinois
John A. Creighton Medical College	(1905)	Nebraska
Bellevue Hospital Medical College	(1875)	New York
New York Homeo. Med. Coll. and Flower Hospital	(1910)	New Yokr
University of Buffalo	(1915)	New York
Miami Medical College	(1894)	Minnesota
Medico-Chirurgical College of Philadelphia	(1902)	Penna.
University of Pennsylvania	(1912)	Penna.
Western Pennsylvania Medical College	(1895)	Penna.
University of Tennessee	(1915)	Tennessee
Vanderbilt University (1908) Alabama	(1913)	Tennessee

Idaho October Report

Dr. Charles A. Dettman, secretary of the Idaho State Board of Medical Examiners, reports the written examination held

at Wallace, Oct. 3, 1916. The total number of subjects examined in was 11; total number of questions asked, 110; percentage required to pass, 75. The total number of candidates examined was 12, all of whom passed. Four candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery		(1913)	83
University of Illinois		(1916)	88
Kentucky School of Medicine		(1879)	78
Tufts College		(1907)	82
Detroit College of Medicine		(1912)	81
Barnes Medical College		(1910)	83
Columbia University, Coll. of Physicians and Surgeons		(1903)	86
University of Oregon		(1906)	87
Jefferson Medical College of Philadelphia		(1915)	86
University of Vermont		(1914)	83
Marquette University		(1913)	85
McGill University		(1902)	88

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
George Washington University		(1906)	Utah
Chicago Medical College		(1876)	Utah
Rush Medical College		(1915)	Utah
University of Illinois		(1914)	Utah

Iowa October Report

Dr. Guilford H. Sumner, secretary of the Iowa State Board of Medical Examiners, reports the written examination held at Des Moines, Oct. 17-19, 1916. The total number of subjects examined in was 8; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 18, all of whom passed. Fourteen candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Georgetown University		(1916)	84
Atlanta Medical College		(1916)	82.9
Chicago College of Medicine and Surgery		(1911)	84.4
Northwestern University	(1906) 77.5;	(1916)	93
Rush Medical College		(1914)	92.5
University of Illinois	(1914) 94;	(1916)	88.2
Indiana Medical College, Purdue University		(1907)	94
State University of Iowa, College of Medicine		(1916)	81.4
Tulane University of Louisiana		(1915)	83.9
Harvard University		(1916)	84.6, 88.2
Homeopathic Medical College of Missouri		(1903)	77
University of Pennsylvania	(1904) 82;	(1916)	91.5
Woman's Medical College of Pennsylvania		(1916)	87.9
Vanderbilt University		(1915)	88.7

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Atlanta Medical College		(1915)	Georgia
Chicago College of Medicine and Surgery		(1910)	Kentucky
		(1913)	Wisconsin
Illinois Medical College		(1905)	Ohio
Keokuk Med. Coll., Coll. of Phys. and Surgs.		(1908)	Kansas
University of Minnesota	(1896)	(1914)	Minnesota
Barnes Medical College		(1909)	Missouri
National University of Arts and Sciences		(1914)	Missouri
St. Louis College of Phys. and Surgs.		(1908)	Wisconsin
St. Louis University		(1915)	Missouri
Washington University		(1915)	Missouri
John A. Creighton Medical College		(1912)	Nebraska
Marquette University		(1914)	Wisconsin

Minnesota October Report

Dr. Thomas S. McDavitt, secretary of the Minnesota State Board of Medical Examiners, reports the oral, practical and written examination held at Minneapolis, Oct. 3-6, 1916. The total number of subjects examined in was 18; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 8, all of whom passed. Eleven candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Rush Medical College		(1916) 84,	85, 85
Johns Hopkins University		(1915)	87, 90
University of Michigan		(1884)	78
University of Minnesota		(1916)	85
Columbia University		(1914)	89

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University		(1901) (1911)	Illinois
Rush Medical College		(1911) (1915)	Illinois
University of Illinois		(1915, 2)	Illinois
State University of Iowa, Coll. of Homeo. Med.		(1915)	Iowa
State University of Iowa, College of Medicine		(1901)	Iowa
University of Michigan		(1912)	Michigan
Marquette University		(1913) (1916)	Wisconsin

Book Notices

FOCAL INFECTION. The Lane Medical Lectures. By Frank Billings, Sc.D., M.D. Delivered, Sept. 20, 21, 22, 23 and 24, 1915, Stanford University Medical School, San Francisco, Calif. Cloth. Price, $2. Pp. 166. New York: D. Appleton & Co., 1916.

This volume contains the Lane lectures delivered by Dr. Billings at the Stanford University Medical School in September, 1915.

In the introduction Dr. Billings traces in brief the history of the development of our knowledge of focal infections, noting especially the cooperative spirit between the clinicians and laboratory workers—the team work in which even nurses and patients took part—which made these investigations possible. He shows how numerous research institutions were gradually drawn into the work, and with characteristic modesty disclaims the larger share of the credit for the investigations, naming himself as spokesman of those who took part in the work. Those who know will say that he was the leader.

In his first lecture, which is devoted to a general consideration of the subject, Dr. Billings rapidly traces the growth of bacteriology and antiseptic and aseptic surgery. He then takes up the etiology of focal infections, paying special attention to work on pyorrhea alveolaris. It is interesting to note his position as to the importance of the endameba. He says (p. 6):

> Doubtless the endamebas play an important part in the occurrence of pyorrhea alveolaris and permit infection with the pyogenic bacteria. The bacteria present in the infected areas are the important factors, however, in the causation of general infection from the focus.

He then takes up other infections occurring in the mouth, throat, larynx and pharynx, naming the various organisms which usually inhabit these regions and produce diseases in them. He considers also focal infections in the gastro-intestinal tract and its appendages, showing the relation of the popular idea of autointoxication to those infections. He names, too, the organisms from the throat, nose and teeth producing lesions in the gastro-intestinal tract. He considers the genito-urinary tract and then the general systemic effects of focal infections, the diagnosis of focal infection, the various methods of dissemination of the organisms from the focus to the rest of the body, and finally the relation of infection to anaphylaxis.

The second lecture concerns the streptococcus-pneumococcus group and the various transmutations which the members of this group undergo. In this work the laboratory study was carried out chiefly by Dr. Rosenow working under the direction of Dr. Hektoen, and obtaining his clinical material largely from Dr. Billings. The work represents perhaps one of the most important studies of the last decade. In this chapter are illustrations showing the transmutation of a hemolytic streptococcus from a case of scarlet fever into a *Streptococcus viridans* and into a pneumococcus. Here Dr. Billings quotes extensively from Rosenow's work on the elective localization of streptococci (THE JOURNAL, Nov. 13, 1915, p. 1687), and gives in detail the technic by which Dr. Rosenow obtained his results.

The third lecture concerns the acute diseases related to focal infection. These diseases have always constituted one of the most puzzling problems of medicine. Acute rheumatic fever, rheumatic endocarditis, myocarditis and pericarditis, chorea, the various gonococcal infections, malignant endocarditis, nephritis, appendicitis, cholecystitis, gastric ulcer, pancreatitis, erythema nodosum, herpes, myelitis, thyroiditis and iridocyclitis are all shown to be frequently related to a focus of infection elsewhere in the body. Credit is given to Poynton and Paine, the English investigators, whose early observations have been so brilliantly confirmed by American investigators. When one contemplates the list of appalling diseases which have been taken from obscurity and made susceptible to scientific treatment, one begins to realize the greatness of the achievement. In this chapter, too, are fifty-four illustrations showing the pathologic effects of the organ-

isms, as well as the various phases of the organisms themselves.

Naturally, the next lecture is devoted to the chronic diseases related to foci of infection, and every physician who has attempted to analyze and treat a chronic infectious arthritis, a chronic peptic ulcer or a chronic endocarditis will realize the great value of the investigations relating to these conditions. The following statement is a short summary of one of the important findings (p. 125):

The focus of infection which undoubtedly causes the *Streptococcus viridans* bacteremia and chronic malignant endocarditis is often alveolar abscess. Of this we have had numerous clinical examples. Coincident cultures from the alveolar abscess and from the blood have yielded strains of *Streptococcus viridans*. When these nascent cultures were intravenously injected into animals, typical endocardial lesions resulted. Doubtless a focus containing this streptococcus may be located in the tonsil or nasal sinus or elsewhere which may be the source of the cardiac infection.

To many physicians the final lecture headed "Treatment" will be the most important. The first part of the lecture is devoted to the prevention of focal infections. The author then takes up the treatment of the resulting diseases, and in concise statements points out the necessary procedures. The lecture concludes with a discussion of serum and vaccine therapy and the use of nonspecific protein injections.

Many readers will, of course, be especially interested in Dr. Billings' view on the use of vaccines in these conditions. He states that it soon became apparent that estimations of the opsonic indexes were not an adequate guide to the effects of the vaccines. Patients were then studied in two groups, one with vaccine and one without, and it was found that (p. 154):

The final result was quite as satisfactory without as with vaccine, in patients suffering with chronic infectious arthritis and acute rheumatism.

Patients suffering with chronic *Streptococcus viridans* endocarditis were not benefited by autogenous vaccines. Indeed, I believe some of them were made distinctly worse when moderately large doses of vaccines were used.

Dr. Billings' concluding statement as to the therapeutic use of vaccines is a classic admonition which deserves a prominent place on the desk of every physician—in fact it might well be framed and pointed out to the ubiquitous detail man who foists his ultra-unscientific preparations on the unwilling physician (p. 154):

Based upon the work of Wright, but disregardful of the principles developed by him, therapeutic vaccination has progressed in this country into an irrational fad which is intensified and made degrading to the medical profession and harmful to the patients by commercial greed.

We are forgetful of the principles of medical practice of our fathers. They recognized the influence of old age, exposure to extreme cold, poverty and poor nutrition, physical and mental exhaustion, faulty personal hygiene and other debility-producing factors in the causation and also in the prolongation of infectious and other diseases. They also recognized the necessity of the removal as far as possible of all these contributory etiologic factors in the management of the patient. The modern vaccinationist pins his faith on the advertised specific virtues of stock vaccines, which he may employ in polyvalent form to insure a sure-shot effect. He believes vaccines will arouse specific defenses in the tissues of the patient in spite of all contributory etiologic factors of disease. Therefore, the rational diet, proper baths, passive and active exercise, correction of personal uncleanliness and alcohol misuse are neglected. The practitioner usually is ignorant of all laws of immunology. It is this want of knowledge which makes him believe the ridiculous statements made by the manufacturers of vaccines.

Modern experimental investigation of the physiologic action of drugs has done much to restrict the abuse of drug therapy of the past. So, too, must the practitioner be made acquainted with what we know and do not know of immunology. We must restrict the therapeutic use of bacterial antigens to those conditions which the known laws of immunity and scientific clinical experience have proved to be safe and of value.

The final statement (p. 157) is:

The mode of action of the nonspecific albumose antigens, injected intravenously, is not well understood. Their use in acute and chronic infectious diseases affords a fruitful field of combined research by the immunologist and clinician.

As readers of THE JOURNAL know, many new studies in this field are beginning to appear in medical literature.

The book is slightly marred by a few minor typographical errors, but these, of course, will be caught in the next impression.

THE AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY. Edited by Casey A. Wood, M.D., C.M., D.C.L., Professor of Ophthalmology and Head of Department, College of Medicine, University of Illinois. Volume 9—Institutions for the Blind to Lemotes. Cloth. Price, $6. Pp. 6419 to 7190, with illustrations. Chicago: Cleveland Press, 1916.

This volume maintains the high standard of its predecessors. There are so many articles of merit that it is impossible to enumerate them. There is one, however, of such transcendent excellence as to demand special mention. This is Dr. Shastid's masterly monograph on the "Legal Relations of Ophthalmology." The interest of this article is by no means confined to the special branch of medicine with which it purports to deal. In the introductory part the general question of technical evidence in this and other countries is treated, and the judicial organization is briefly but sufficiently explained. This part of the article should be read by every medical man and every person interested in the question of expert testimony.

THE MEDICAL RECORD VISITING LIST, OR PHYSICIANS' DIARY FOR 1917. Leather. Price, $1.50 (for 60 Patients a Week). New York: William Wood & Co., 1916.

THE PHYSICIAN'S VISITING LIST (LINDSAY & BLAKISTON'S) FOR 1917. Leather. Price, $1.25. Philadelphia: P. Blakiston's Son & Co.

These lists have been issued for 1917 with revised tables of dosages in apothecary and metric systems, based on the new pharmacopeia. They contain the usual ruled pages for entering daily calls and visits, memorandums, consultations, obstetric engagements, vaccinations, deaths, addresses, and cash account. Extra pages are devoted to tables of weights and measures, duration of pregnancy, treatment of poisoning, etc. The books are nicely prepared in leather covers with a pocket for extra papers and a pencil in each. Perhaps three fourths of the general practitioners of the country use these books as the first step in daily bookkeeping. They are a valuable accessory to businesslike practice.

Social Medicine, Medical Economics and Miscellany

NOTES ON ONE THOUSAND, THREE HUNDRED AMBULANCE CALLS IN NEW YORK

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The character of work and the methods employed in an emergency ambulance service are of interest not only to the general practitioner, but perhaps more particularly to those who are contemplating engaging in such a service. The fact that there has been no description of this type of work in recent years prompted the writing of the following brief account of a six months' service in New York.

New York is divided into ambulance zones, the ambulance calls of each zone being answered by a given hospital, which acts in cooperation with the police department. Each of these hospitals maintains from two to four ambulances, and in case these are all out when a call comes in, it is referred to the hospital in an adjoining district.

Any citizen who is sick or injured is entitled to the ambulance service. An ambulance may be summoned (*a*) by asking a policeman, who is expected to satisfy himself that it is really needed before calling in from the signal box, or (*b*) by calling either police headquarters or the hospital directly, giving one's own name and address and the nature of the case. When a call is received in the latter way, a patrolman is dispatched at once from the nearest police station to the scene of the call. Prisoners in the police stations are also treated by the nearest "ambulance surgeon."

The district of the New York Hospital includes the territory bounded by Forty-Second Street, Fourth Avenue, Fourteenth Street and the Hudson River. The service is so arranged that on alternate days the second assistant house

surgeon answers all first calls of the ambulance, and is on first call for patients coming to the accident room from 6 a. m. until the following 6 a. m. The second assistant house physician answers the second calls of the ambulance, and the third calls are taken by the other second assistant house surgeon who was on first call the preceding day, except during the six or nine hours he is off duty. During the twenty-four hours on first call, the ambulance man averages about fifteen calls (twenty-three being a maximum). He is on duty for six months, and answers in this time from 1,200 to 1,400 calls.

TABLE 1.—CHARACTER OF CASES

Condition	Number
Lacerated wounds	269
Contusions and abrasions	171
Fractures, 71, and possible fractures, 34	105
Alcoholism, acute and chronic	90
Gastro-enteritis, etc.	66
Syncope ("fainting spells")	46
Hysteria	45
Dead on arrival	44
Epilepsy	35
Cardiac and cardiorenal cases	25
Tuberculosis	24
Diagnosis uncertain	24
Psychopathic cases	24
Arthritis and allied disorders	20
Labor	19
Pneumonia, 11, and suspected pneumonia, 8	19
Sprains: ankle, 11, wrist, 2, back, 2	15
Incomplete abortion	14
Appendicitis, 12, and suspected appendicitis, 2	14
Hemiplegia 5, cerebral hemorrhage, 6, and cerebral neoplasm, 2	13
Dysmenorrhea	12
Burns	12
Gonorrhea, chiefly epididymitis	10
Poisoning: gas, 3, strychnin, 1, iodin, 1, phenol (carbolic acid), 1, smoke, 3	9
Heroinism	8
Salpingitis, 4, metrorrhagia, 2, endometritis, 1, vulvovaginal abscess, 1	8
Dislocations: shoulder, 4, thumb, 1, little toe, 1	6
Perforated gastric ulcer	5
Miscellaneous, including convulsions, 5, erysipelas, 5, gunshot wounds, 4, poliomyelitis, 4, asthma, 4, rectal abscess, 4, carcinoma, 3, cholelithiasis, 2, tonsillitis, 2, chorea, 2, nephrolithiasis, 1, large uterine fibroid, 1, measles, 1, influenza, 1, vomiting of pregnancy, etc.	135

The disposal of patients for whom the ambulance has been called is left to the discretion of the ambulance surgeon. Either he may (*a*) treat the patient outside the hospital (in his home, the police station or elsewhere) as in the case of small lacerated wounds, hysterical attacks, etc., or (*b*) he may bring the patient to his own hospital where either he may treat the patient himself, or, if the injury or disease is of a more serious nature, the patient is admitted to the ward and seen by the house surgeon or physician, who in turn consults the attending surgeon or physician. Patients with chronic conditions, including pulmonary tuberculosis, acute venereal diseases and alcoholism, are taken directly to Bellevue, the large city hospital.

The ambulance surgeon's bag contains a very practical outfit, including sterile instruments, gauze, needles, suture materials, and rubber tissue drains, razor, scalpel, mouth gag, stomach tube, sterile catheter, tracheotomy tube, aromatic spirits of ammonia, usually administered by inhalation, tincture of iodin, soap solution, collodion, whisky, chloroform, alcohol and ether, ergot, baby cord, argyrol, nasal tampons, amyl nitrite pearls, and a hypodermic outfit with solutions of the commoner drugs in rubber-capped vials. In the ambulance are kept padded splints of various sizes, bandages, boric ointment and sodium bicarbonate solution.

The character of the cases is quite variable, and may best be understood by reference to Table 1, which shows the diagnoses made, some of which, however, proved to be incorrect. The ambulance man is expected to make a diagnosis in the minimum of time, his chief concern being, "Is the patient's condition serious enough to warrant his being taken to the hospital?"

The lacerated wounds were chiefly of the scalp, and the majority of these patients were alcoholic, the injuries being sustained principally in falls or in fights, although there were many exceptional cases, as one of a patient who was struck on the head by a bolt which fell several stories from a structural steel work. Street accidents, particularly those due to automobiles, accounted for a large number. Fourteen of the 269 cases were stab wounds of varying extent, from a wound which laid wide the cheek, to multiple futile hacks with a penknife. The severest lacerated wounds seen were in the cases of a longshoreman whose chest was torn through to the pleura and of a boy of 9 who had been run over by a heavy motor truck. The smaller wounds were treated by tincture of iodin, a few horsehair sutures and a sterile dressing, and the patients were referred to a hospital for further treatment. The more severely injured were brought directly to the hospital.

In the class of cases under the heading "contusions and abrasions," the chief interest lay in the responsibility of excluding fractures or possible fractures.

The fractures and possible fractures comprised an interesting group whose variety is indicated by Table 2.

In the cases of fractures of the long bones, the clothing was rarely cut away, but a splint of adequate length (from foot to axilla in cases of fractured femur) was carefully bandaged on outside the clothing before the patient was moved. A considerable number of the fractures were set and put up in molded plaster-of-Paris splints at the hospital by the ambulance surgeon himself. In compound fractures an attempt was always made to place sterile gauze over the wound before applying the splint. Two of the severest cases of this class were an attempted suicide in front of a subway train in which the patient sustained a compound fracture of the leg, and the other a "jitney-bus" crash in which the two patients sustained a compound fracture at the shoulder and a compound fracture of the leg, respectively. The cases classed as "possible fractures" included those in which the possibility of fracture could not be excluded. In these first-aid treatment should be identical with that of actual fractures.

The alcoholics presented an interesting but uninspiring group. Most of them were chronic alcoholics, the classical "bum" of common parlance, worthless derelicts with shaking hands, without jobs, whose beds were the park benches and whose blankets were newspapers. Those with delirium tremens varied from the harmless "rat hunter" to those violent ones whom only the policeman's "nippers" could subdue. The acute alcoholic coma, which caused the friends or bystanders to think the patient on the verge of death, was treated by having the extremities firmly held by the strongest persons around (the policemen) and by holding a large piece of gauze saturated with aromatic spirit of ammonia tightly over the nose and mouth. The result was generally startling, and after a few emphatic remarks the patient would get up and walk home. An ambulance service tends to give one an alcoholic point of view, and the temptation to forget that the alcoholic may suffer from other diseases as much as any one else is the ever-present danger of the ambulance surgeon. I shall not forget one case of a bedraggled woman found in the street at 3 a. m., whom I thought drunk, and took to the police station. I attempted to revive her by compelling her to inhale the usual aromatic spirit of ammonia, but she died within ten minutes after her arrival. This was a lesson not to be forgotten.

TABLE 2.—FRACTURES AND POSSIBLE FRACTURES

	Number
(*a*) Fractures	
Humerus	3
Clavicle	2
Skull	9
Colles'	5
Patella	2
Nose	4
Fibula	3
Femur	3
Tibia	6
Radius and ulna	1
Jaw	3
Vertebra	1
Sacrum	1
Small bones of foot	4
Ankle	3
Compound, including arms, legs, fingers, etc.	17
Miscellaneous	4
	71
(*b*) Possible Fractures:	
Skull	14
Ribs	8
Small bones of foot	5
Vertebra	4
Ankle, etc.	3
	34

The group classed as hysteria comprised patients who best were calculated to try one's patience and whose treatment, moreover, was the most difficult of any of the ambulance patients. The subjects were chiefly young and emotional girls engaged in the intensive painstaking work of clothing manufacture, in which they seem constantly to be subjected to a high pressure to increase their output of work and not uncommonly are antagonized by the hectoring of selfish supervisors. The patient is generally found surrounded by a group of excited girls whose often frantic efforts to revive or to quiet her generally aggravate her condition. She may be almost rigid and anesthetic, or may be crying wildly. Tact, a few comforting words or the suggestion of a new train of ideas occasionally suffice to bring the patient back to normal condition. More commonly the best results seem to be obtained by refraining from sympathy, of which the patient probably has had generous measure before the physician has arrived, and by employing harsh, vigorous words, or, as a last resort, forcibly compelling the patient to inhale aromatic spirit of ammonia. This rarely fails to bring about indignation—and a cure.

In the forty-four cases in which the patient was found dead on arrival, no attempt was made to assign a cause of death, this being a duty of the coroner's physician. The ambulance man has merely to pronounce the patient dead. The causes were often apparent, however—numerous cardiac failures, suicides, chiefly by means of illuminating gas, falls from high buildings, and in one case each revolver bullet, elevator accident, and a wagon wheel passing over the head of the patient (a boy).

Several desperate cases of pulmonary edema were seen. By the administration of atropin and morphin it was usually possible to get these patients to the hospital.

No deliveries were made on ambulance calls. Patients in labor were taken to a hospital as rapidly as possible. When, as was frequently the case, the baby was born by the time the physician arrived, the cord was cut, the placenta expressed if necessary, and the patient was invariably offered the opportunity of going with her baby to the hospital.

Though there are only eight cases of heroinism listed above, not a few of the other patients were drug habitués. These patients never told where they obtained the drugs, but almost invariably attributed the acquisition of their habit to "bad company."

There were a number of major surgical emergencies. Three perforated gastric ulcers were recognized. In one of four days' standing, with general peritonitis, the diagnosis was missed; while in another case in which the diagnosis of perforated gastric ulcer was made, necropsy a few days later showed an acute hemorrhagic pancreatitis. There were a number of cases of acute appendicitis, two cases of acute cholecystitis, two cases of ruptured ectopic gestation and one of intestinal obstruction.

The four dislocated shoulders were successfully reduced on the ambulance calls. The patients with erysipelas were taken to Bellevue Hospital, and the board of health was notified of the discovery of cases of contagious diseases.

The ambulance service brings the physician into all kinds of places, from the Eleventh Avenue saloon fights to the Waldorf, from accidents in the crowded shopping districts to the squalor of the most crowded tenements, into the holds of ships, up in the iron framework of new buildings, behind the scenes at the theaters, and sometimes to spectacular fires. On one occasion I was given rubber boots and lowered in an iron bucket down a concrete shaft to the great Catskills aqueduct nearly 300 feet below Broadway. For two hours I was in a wreck in the entrance to a Pennsylvania Railroad tunnel while a heroic conductor gamely kept his nerve until the steel wreckage which held his foot fast had been cut away by the oxyacetylene flame. I have seen a blind man who had bled to death from a ruptured varicose vein while his friends looked on helplessly, and the touching efforts of a Frenchman, stricken suddenly dumb by a cerebral hemorrhage, to write us of his condition. On one call an excited policeman rushed up saying, "Doc, this guy's taken iodin and gone mad." But energetic lavage and subsequent questioning revealed the fact that he had tried to frighten his mother-in-law by spilling the iodin on his shirt front. The most bizarre call occurred in the case of F. J. M., Oct. 30, 1916, who, while under the influence of alcohol, fell ten stories through an iron grating onto the upturned nozzle of an automatic sprinkler. The impact of his body not only turned on the sprinkler, but simultaneously sent in a call to the city fire department. The firemen rushed into the building with their fire hose and, finding no fire, turned the water on the unconscious man, thus reviving him, much to his astonished indignation. This man recovered in spite of fractures of a humerus, tibia and several ribs, and multiple lacerations.

A word of genuine praise must be said of the police with whom my duties have associated me during the last six months. Their willingness to be of any service to the physician, their good nature and patience under the most trying circumstances, and their unfailing courage and faithful performance of their duties have aroused my sincerest admiration.

In conclusion, two well-tried rules which are applicable to ambulance surgeons might be suggested: never lose your temper, and play safe.

8 West Sixteenth Street.

Medicolegal

Validity and Application of Law Against Deceptive Advertising

(State Board of Medical Examiners vs. Jordan (Wash.), 158 Pac. R. 982)

The Supreme Court of Washington reverses a judgment of the superior court which reversed an order of the board revoking the defendant's license. The complaint alleged: "That the defendant is a licensed practitioner of medicine and surgery under the laws of the state of Washington; that he advertised his medical business in the Seattle *Daily Times* of Wednesday, Oct. 1, 1913, and in sundry other editions of said Seattle *Daily Times* during the latter part of 1913 and the year 1914; that such advertising of his medical business was such as intended or has a tendency to deceive the public or impose upon credulous or ignorant persons and so be harmful or injurious to public morals or safety, in which respect defendant has been guilty of unprofessional conduct." The supreme court says that this complaint was sufficient. The statute has wisely allowed the defendant a first hearing before brothers in his own science. To say that such persons, unacquainted with the law, must conduct these examinations or invite them with legal nicety will not do. This court so held even on misdemeanor for practicing without a license. The courts uphold the less technical practice. The defendant's rights were easily protected either by demand for particulars or by motion to make more definite. The case was not criminal by its nature. The legislature had an undoubted right to classify this proceeding, and it did so by providing that appeals from the board should stand for trial "in all respects as ordinary civil actions, and like proceedings be had thereon."

The portion of the statute more particularly involved in this case was that part of the section defining unprofessional conduct which includes: "All advertising of medical business which is intended or has a tendency to deceive the public or impose upon credulous or ignorant persons, and so be harmful to public morals or safety." It was contended that there is an uncertainty in this subdivision, and that it furnishes no standard by which either board or court can determine what advertisement offends. But the statute enumerates seven things that constitute unprofessional conduct, and the one relating to advertisement could not well be made more specific. To describe in express terms a faulty advertisement is practically to instruct the defendant how to evade it, and as to the limitless variations in language, symbols and verbal or pictorial allurements, no human ingenuity could possibly anticipate and forestall them. To the court there seems a happy reply on any basis to arguments of this sort. Under the Washington statute the defendant is not tried on the advertisement alone, but on the

advertisement and his capacity, qualifications or actions to fulfil it. The appeal to the superior court secures a trial de novo, or anew. In such trial a proper line of proof is not only the advertisement, but also the competence of the defendent to do what he advertises he can do. The issue then becomes like that in getting money by false pretenses, which no legislature has ever been required to define. The crime is determined not from the representations alone, but from all the actions and circumstances in which intent can be gathered. The Washington law has not prevented a practitioner from advertising cures or inviting the public to his healing, but only advertisements to beguile. It attacks not mere unethical conduct, but wrongful conduct. If from the testimony it appears that he either does not cure the diseases, never has cured them, cannot cure them, or does not know what they are, the law has then a right to say it is advertising to deceive. It is not merely unethical, but immoral, to get money from the poor, the simple or the ignorant by advertising the cure of what is incurable, and the courts will call that incurable which the present stage of knowledge so pronounces. Nor was it incumbent on the state to show whether actual harm had yet come to any one through this practitioner. That is not material. The state aims to protect the purse as well as the health from quacks, and the other burden, if cast on the board, would, through the many confusing and contributing influences on the health of patients, make proof exceptionally difficult. Neither was the court impressed by some twenty witnesses testifying to the defendant's cures, nearly all the patients being uncertain what their ailments really had been.

Illegal Practicing Without Charging Fees — Not Emergency Service

(People vs. Vermillion (Calif.), 158 Pac. R. 504)

The District Court of Appeal of California, Second District, affirms a conviction of the defendant of having practiced a system and mode of treating the sick and afflicted without possessing a certificate issued by the state board of medical examiners entitling him so to do. The court says that it was contended that he could not be properly convicted unless it were shown that he charged a fee for his services, but the court thinks that this contention must be decided against him. The statute under which the prosecution was had makes it unlawful for a person to practice any art of healing without having first obtained a certificate from the medical board, and the court thinks the act is intended to, and does, cover such practice whether the service is gratuitous or not. However, it was shown in evidence by the defendant's own testimony that he had engaged in the practice of a healing art, styling himself a "chiropractic," for a period of five years immediately preceding the date of his arrest. It was shown that he maintained a regular office in a business building in the city of San Diego, and there was testimony showing that he had treated in a professional way three different patients who were suffering from bodily ills. There was evidence also that in one case payment was offered and accepted by him in return for the services rendered. The defendant admitted the receipt of this money, but declined to state whether he regularly made a charge for his services. The fair inference from all the testimony, which the court thinks the jury was entitled to draw, was that he regularly practiced a healing art, and, furthermore, that he did so for remuneration. Some contention was made that the service which the defendant rendered to persons described in the evidence was in the nature of emergency service not prohibited by the medical act. There was no evidence tending to show that the services were of an emergency character, that is, services rendered by way of affording temporary relief until the services of a regular practitioner could be procured. The persons who were thus treated were shown to have previously had the attention of physicians, and their ailments were more or less of a chronic sort, and that the services of the defendant were sought, to some extent, at least, as a last resort and after other practitioners had failed to afford relief. Treatment so rendered could not, in any sense, be classed under the head of "emergency service."

Society Proceedings

COMING MEETINGS

Congress on Medical Education, Public Health and Medical Licensure, Congress Hotel, Chicago, Feb. 5-6.
Western Roentgen Society, Hotel Sherman, Chicago, Feb. 16-17.

SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION

Twenty-Ninth Annual Meeting, held at White Sulphur Springs, W. Va., Dec. 11-13, 1916

The President, DR. THOMAS S. CULLEN, Baltimore, in the Chair

Biochemistry of Topical Applications: Use of Boric Acid in Septic Infections

DR. EDWARD H. OCHSNER, Chicago: Osmosis is not dependent on the semipermeability of the membranes, but on the chemical affinity different substances have for each other. Concentration of the solution is also an important determining factor. Clinically, laboratory experiments can be duplicated by using solutions of boric acid and water as a wet dressing. A saturated solution of boric acid when applied to the skin will invariably appear in the urine in appreciable quantities within an hour, and if a wet dressing is kept in place for a considerable time, the amount of boric acid which appears in the urine may rise as high as 0.2 per cent. In order to be effective, boric acid must be used in saturated solution. While boric acid does not destroy pathogenic bacteria, it greatly reduces their virulence. Wet dressings of boric acid are much more effective in streptococcus, *Staphylococcus albus*, and *S. citreus* infections than in any other type of infection. In order, however, that boric acid may reach its maximum of efficiency, some other directions should be observed, such as: absolute rest in bed; proper attention to elimination; relief of pain, if possible without the use of opiates, by the addition to the solution of from 10 to 33 per cent. of 95 per cent. alcohol; painting the inflamed area with 95 per cent. phenol (carbolic acid) until it turns white, and then removing the excess of acid with alcohol; elevation of the extremity with the muscles surrounding the involved joint at equilibrium; incision only when there is macroscopic evidence of pus and after a certain degree of immunity has developed. If incision becomes necessary, an Esmarch bandage should first be applied whenever possible, and then the incised wound should be swabbed with tincture of iodin before the Esmarch bandage is removed and the part should be manipulated as little as possible.

Treatment of Fractures of the Femur, Especially in the Old

DR. GEORGE TULLY VAUGHAN, Washington, D. C.: I do not believe in operating in every case of fracture of the femur or in putting foreign material into the tissues, except when necessary. For neck fractures, with impaction and good position, plaster of Paris is applied, with the limb in normal extension; with displacement of fragments, Whitman's extreme abduction and plaster; if this should fail to effect reduction, I use the open operation, and the use of a screw or other means should be considered. For shaft fractures, when Buck's and other methods of extension are not indicated and open operation is decided on, several methods may be used, preferably exposure of the fragments and their coaptation in such a way as to maintain their position by an external splint. In oblique fractures this can be done by the interlocking method, that is, inserting one of the sharp ended fragments into the medullary cavity of the other; in transverse fractures, by an intramedullary splint taken from the fractured bone. If it is necessary to use metal, the plates and bands are preferred to wire, nails and screws. For transverse fractures, I use Lane's plates, and for oblique ones the steel bands of Parham and Martin. No weight should be borne for four months on a femur which has been fractured, and good functional results should not be expected sooner than from six to twelve months.

Open Treatment of Certain Fractures of the Long Bones

DR. H. HORACE GRANT, Louisville, Ky.: The advantage of directing the adjustment and fixation of the fragments in most fractures of long bones under the eye is so positive as to need only a safe and simple method for general adoption. Badly apposed, as well as ununited fractures of the long bones demand undelayed treatment by the open method. Fixation by absorbable ligatures requires as much or more manipulation as putting in plates, and wiring of the fragments accomplishes poor fixation with the drawback of the retained foreign body. The Lane plate in skilled hands accomplishes, perhaps, the best fixation, but carries the serious objection to the inexperienced of infection, and even when all seems to go well, later removal is often required. If by a simple inexpensive and safe method of fixation, not even involving the broken surfaces, approximation can be maintained, it should become the ideal method.

DISCUSSION

DR. W. P. CARR, Washington, D. C.: I protest against the recommendation for operating so freely, and against the idea of fixing a long bone in alinement by means of screws, plates or bands. There are very few cases of fracture of the femur that require any operation at all.

DR. A. A. LAW, Minneapolis: The Maxwell-Ruth method of treatment is particularly applicable to fractures of the neck of the femur in old persons.

DR. ALEXIUS MCGLANNAN, Baltimore: The essential point in the treatment of fracture of the femur is to reduce the fracture. The manner in which we fix the limb is a matter of relative indifference, because the bad results in treating fractures of the neck of the femur are due to the fact that the fracture is not properly reduced. It can be reduced by abduction, traction and inward rotation.

DR. J. M. MASON, Birmingham, Ala.: With the assistance of the fluoroscopic table we have been able to determine immediately what we are accomplishing in reducing fractures.

DR. E. D. MARTIN, New Orleans: One of the most valuable adjuncts in the treatment of femur fractures in old persons is the use of the Hodgen splint. I can recall at least fifty cases in which we made use of this splint with gratifying results.

Substitution of the Anal for the Vesical Sphincter in Certain Cases of Inoperable Vesicovaginal Fistulas

DR. REUBEN PETERSON, Ann Arbor, Mich.: The operative procedure of substituting the anal for the vesical sphincter was suggested by Jobert in 1836 and Bérard in 1845. It was performed first by Maisonneuve in 1851, but his patient died. There were seven such operations from 1871 to 1881, twenty-two from 1881 to 1891, seven from 1891 to 1901, and there have been three since. Childbirth was given as the cause of the defects causing the incontinence in thirty-three of the forty-one cases. In four cases, incontinence followed removal of the urethra and parts of the bladder for malignant disease. Sloughing following typhoid and diphtheria, and a gunshot wound was the cause in one case each. In ten cases there were vesicovaginorectal fistulas, while in thirteen cases the urethra was destroyed. In all the cases, almost without exception, plastic operations had been tried but had failed. The woman should have the privilege of choosing such an operation in place of repeated attempts at plastic repair with failure. The procedure never will be an ideal operation, but is preferable to allowing the woman to suffer from urinary incontinence, even if intercourse is interdicted. The primary mortality of the operation should be nil. In only one instance in the forty-one cases was there a primary death, the first patient in the series, who died of septic phlebitis, an avoidable accident today. In only two cases was there primary union of the colpocleisis wound, but the resulting fistulas heal readily under caustic applications. In not a single case of the forty-one was there rectal irritation. There was no diarrhea, some patients even being constipated. Usually the urine is held from one to five hours with one or more formed stools a day. In twelve cases the women menstruated through the rectum. In nine cases the menstruation ceased after the operation without apparent cause. Ascending renal infection did not take place in any of the cases. The only doubtful case is that of Rose, in which the patient died ten months after the operation from nephritis which necropsy showed was not due to the operative procedures.

Cure of a Double Femoral Aneurysm by Proximal Occlusions with an Autoplastic Fascial Flap

DRS. E. G. JONES and C. E. WAITS, Atlanta, Ga.: We partially constricted the femoral with an autoplastic flap dissected up from Poupart's ligament for the purpose of treating two aneurysms in the thigh. Twenty-six months after the operation the patient remained well, and there were no signs of the aneurysms. Function in the leg remained normal, except for some numbness about the calf. In order to discover if such a band would be dangerous from the standpoint of erosion and hemorrhage, and if, when so applied, there would be material danger of gangrene or loss of function, we treated the femoral twenty-four times in dogs with uniformly satisfactory results. The partial occluding band results in gradual complete occlusion of the vessel. Histologic examination from twelve to fourteen weeks after operation shows the fibrous band grafted about the circumference of the vessel.

Traumatic Aneurysm of Temporal Artery

DR. J. SHELTON HORSLEY, Richmond, Va.: Since 1896, only five cases of traumatic aneurysm of the temporal artery and its branches have been reported, besides two of my own. In neither of my cases was there any evidence of syphilis or other disease of the arteries. One was in a youth, aged 19, who received an injury in the right temporal region while playing basket-ball. This was immediately followed by a large hematoma which was partially absorbed, but resulted in a small pulsating aneurysm about one-half inch in diameter. Operation was done seven months after the injury under local anesthesia, the sac being excised after the arteries were ligated. The second case was in a boy, aged 9 years, with a somewhat similar history, being injured while wrestling. This aneurysm formed in the temporal artery just above the zygoma. It was excised under local anesthesia. There was no recurrence in either case.

Some Problems of Ureteral Surgery

DR. WILLIAM R. JACKSON, Mobile, Ala.: Injuries to the ureter during hysterectomy are more frequent than is perceived at the time of the operation. Discovery of the injury is more often made several days after operation than at the time it is performed. It often means the sacrifice of the kidney of that side, and sometimes the death of the patient. It is better not to attempt to repair the ureter, if there is serious doubt of its accomplishment. Even if the operator is an expert, attempts at repair frequently result disastrously. Removal of the kidney would be better under such circumstances. A kidney should not be removed to cure a leaking ureter until one is sure of the presence of a perfectly sound kidney on the opposite side. It is frequently better to ligate the ureter doubly than to attempt to do an anastomosis. Before ligating, it is well to ascertain if a kidney is present on the other side.

Ureter Stricture

DR. GUY L. HUNNER, Baltimore: By far the greatest source of ureter stricture is some distant focus of infection. The diagnosis is made on the history, the urine examination, and the physical findings. I take definite issue with the prevailing opinion that dilatation of the kidney pelvis and ureter are due to infection. While the experimental work of Barney and others may lead to the view that the infection per se results in dilatation, one must remember that an inflammatory ureter with its extremely narrow lumen is more than likely to become partially closed at one of its normally contracted points and thus cause back pressure. Many of my patients with sterile urine and no history of previous infection have the dilated ureter and pelvis. The ideal treatment for stricture of the ureter is by dilation from the vesicle approach. In cases in which dilation cannot be accomplished by the vesicle approach, I advise extraperitoneal exposure of the ureter and retrograde dilation. This was done in eight of

my first fifty cases with excellent results in six. Two of my early patients failed to obtain complete relief, probably because of insufficient dilation. Two of my first fifty patients had resection of the ureter with implantation in the bladder.

Cholecystitis With and Without Gallstones

Dr. George A. Hendon, Louisville, Ky.: Of thirty cases stones were present in eighteen, or 60 per cent. A history of stomach trouble existed in twenty-five, or 83 plus per cent. Nine cases, or 30 per cent., were jaundiced at some period in the history of the complaint.

Recurrence of Gallstones

Dr. John B. Deaver, Philadelphia: The failure to remove all the gallstones at the primary operation is the most potent cause of recurrence of symptoms. This adds emphasis to the arguments which surgeons are continually bringing forth of the importance of early operation. Kehr does not hesitate to lay much of the blame for recurrent gallstones on the medical man. He points out that in long standing cases the gallducts become dilated, and stones are apt to lodge in the recesses, so that they cannot always be removed or even be detected at operation, and thus give rise to renewed attacks of cholelithiasis. My experience, comprising practically 1,200 operations in the last six years for affections of the biliary passages, convinces me that the appendix, in turn, is the focus of infection for nearly all upper abdominal diseases. It is hardly necessary to dwell on the importance of early removal of even a slightly troublesome appendix in order to avoid future trouble. Disease of the biliary passages is essentially a surgical and not a medical proposition.

Choice of Operative Procedure in Cancer of the Rectum and Pelvic Colon

Dr. Charles H. Mayo, Rochester, Minn.: In the five years preceding 1916, our total operability was 53 per cent., but in the last three years it has risen to 71.8 per cent., indicating that a chance for cure is now being given to a larger percentage of patients with this otherwise hopeless condition than formerly. Of 753 patients a radical operation was performed on 430, with a general operative mortality of 15.5 per cent. Before 1910 the operative mortality was 17.8 per cent. From 1910 to 1913 it was 17.7 per cent., the operability being 51 per cent. In this earlier period a higher percentage of patients were seen late. In 1913, 1914 and 1915 the mortality was reduced to 12.5 per cent., the operability was raised to 71.8 per cent., and the operative efforts were more radical. Of the number of patients operated on, none less than three years ago, one third lived three years or more, and 28.3 per cent. lived five years or more. The patient with no anal control and with the sigmoid loop eliminated is much better off with an abdominal than with a perineal anus. If with loss of the anus the sigmoid loop can be retained, the control will be fair, excepting in case of loose bowel movements. Gas, however, is not controlled. While the union of resected intestine within the abdomen is not followed by stricture, that affected outside of the peritoneal-lined abdomen is practically always followed by stricture, and will usually necessitate some form of colostomy after much effort to maintain the lumen. If by abdominal procedure the division of the bowel below the growth can be made at a point which will leave at least one-half inch or more of peritoneal covered rectum within the culdesac, and the area of the disease to be removed is not too great to prevent coaptation of the divided ends of the bowel, a tube resection can be done with preservation of the control of the anal outlet as a one stage procedure. Cancer of the rectum and rectosigmoid which cannot be removed radically with the preservation of the peritoneal-covered distal bowel is best treated by abdominal exploration, permanent abdominal colostomy and a Kraske removal of all of the rectum at a period one week later—a two stage operation. Cancer of the lower sigmoid extending nearly to the rectosigmoid is well treated by the Mikulicz method, separation of the mesentery and elevation of the diseased loop through the exploratory incision to a position above the abdomen.

(*To be continued*)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

December, 1916, CLII, No. 6

1 *Comparative Value of Methods of Treating Tetanus. C. L. Gibson, New York.—p. 781.
2 *Pathologic Changes in Sympathetic System in Goiter. L. B. Wilson, Rochester, Minn.—p. 799.
3 *Etiology of Pellagra; Consideration of Vitamin Deficiency. E. J. Wood, Wilmington, N. C.—p. 813.
4 *Salvarsan in Treatment of Double Infections, Tuberculosis and Syphilis. N. B. Potter, New York.—p. 823.
5 *Clinical Investigations on Intestinal Autointoxication, Especially as Regards Question of Specificity of Toxin. T. R. Brown, Baltimore.—p. 845.
6 Stock-Brainedness, Causative Factor in So-Called "Crossed Aphasias." F. Kennedy, France.—p. 849.
7 Circumscribed Cysts of Leptomeninges; Report of Successful Operative Case. F. M. Hanes and A. M. Willis, Richmond, Va. —p. 859.
8 *Treatment of Fracture of Spine. N. Sharpe, New York.—p. 865.
9 *Etiology and Prevention of Tuberculosis from Sociologic Points of View. W. C. White, Pittsburgh.—p. 880.
10 Relation of Tuberculosis of Bronchial Lymph Nodes to Diagnosis and Treatment of Tuberculosis of Lungs. M. E. Lapham, Highlands, N. C.—p. 887.
11 *Case of Diabetes Insipidus with Peculiar Necropsy Finding in Posterior Lobe of Pituitary Body. F. P. Weber and H. Schmidt, London.—p. 892.

1. **Treatment of Tetanus.**—Gibson's personal experience in the treatment of tetanus is limited to eight cases; three patients died while five survived. Of these the first two fatal cases did not have the benefit of the more modern or radical methods, whereas the last six are characterized by having received antitoxin intraspinally. Of these six patients so treated since 1907 only one died, a mortality of 17 per cent. Gibson advises that antitoxin treatment be begun immediately on suspicion of tetanus developing rather than waiting for the classical symptoms. It should be given first into the wound or region of the wound, say 1,500 units; intraspinally, without an anesthetic, unless the treatment of the wound calls for the administration of a general anesthetic, 5,000 to 20,000 units. In the course of the first twenty-four hours, in addition to the above, 10,000 to 20,000 units should be administered intravenously in divided doses, say two or three. Antitoxin intravenously from 5,000 to 15,000 units should be given the next day no matter whether the symptoms remit or increase. On the third day if, notwithstanding the treatment, the patient's symptoms continue very severe or appear worse, the intraspinal treatment should be repeated. If after this treatment the patient holds his own or improves, the intraspinal injection need not be repeated but the daily injection of antitoxin intravenously should be given until obvious remission or cure results. One of Gibson's patients received a total of 169,000 units.

2 and 3. Abstracted in The Journal, June 17, 1916, pp. 2031 and 2032.

4. **Salvarsan in Tuberculosis and Syphilis.**—A review of the literature leads Potter to say that the prompt employment of salvarsan or neosalvarsan is indicated in latent, chronic and moderately active tuberculosis; (*a*) as soon as the nature of an added infection is diagnosed with reasonable probability to be syphilis; (*b*) whenever the history, signs, or symptoms strongly suggest a previous syphilitic infection, particularly if such a patient is not improving on the usually successful hygienic and climatic treatment for tuberculosis; but (*c*) active tuberculosis, acute tuberculosis and diffuse miliary tuberculosis are usually definite contraindications to the use of these new arsenic preparations, although in both the first two mentioned groups there will be found many syphilitic patients on whom a small dose of salvarsan may well be tried and, unless followed by untoward effects, cautiously repeated in gradually increasing doses. When tuberculosis infects or becomes active in a patient with secondary, tertiary or even latent syphilis, the careful employment of one of these drugs is also indicated. The more active the tuberculosis, the smaller should be the initial dose; the slower its increase, the less frequent the interval, and the greater care and watch-

fulness required. Tuberculin-like focal reactions may follow their administration, should be carefully watched for, and if present, the location, intensity and character will frequently guide in the selection of the next appropriate dose or interval.

5. **Intestinal Autointoxication.**—The specificity of toxin or bacteria in certain cases of so-called intestinal toxemia or bacteriemia was studied by Brown in three cases of chronic eczema and urticaria, one of pruritus, two of so-called bilious headache and one of choroiditis. This study suggested that in the intestine certain substances are produced which in some instances are possessed of specific action associated with a hypersensitiveness to certain proteins not in themselves toxic but possibly capable of producing a reaction because of an acquired hypersensibility, and that therapeutically a marked improvement in symptoms and even a complete cure may be brought about by the elimination of these substances from the dietary. It is also suggested to Brown by a study of these cases that by giving these foods in gradually increasing amounts a marked increase in resistance may be produced. That in certain cases at least the symptoms are better explained on the basis of a bacterial infection of intestinal origin rather than on that of a toxemia, and that in various cutaneous lesions, testing the cutaneous sensibility by intradermal injection of various proteins is of real value in determining whether or not the condition may be due to certain toxic bases of intestinal origin derived from the decomposition of certain protein foods. These reactions are apparently specific in character, and therefore these tests of cutaneous hypersensitiveness to various proteins probably cannot be used as criteria of other conditions best interpreted as protein intoxications with manifestations elsewhere than in the skin.

8. **Treatment of Fracture of Spine.**—In every case of fracture of the spine with damage to the cord, excepting only complete obliteration of the bony canal, Sharpe says, an early laminectomy is urgently indicated to relieve the cord of the damaging effects of bone pressure, hemorrhage and edema, and to give the nerve tissue the best possible chance for repair.

9. **Etiology and Prevention of Tuberculosis.**—For each 100,000 population White wants a hospital of 200 beds, a dispensary and an open air school. There should be fifteen nurses, of whom five are visiting social service nurses and four or five physicians. Such an equipment might easily expand and include all public activities, child welfare, pneumonia, syphilis and other health and public welfare problems. The expense should be borne as the educational expense is borne, and demand made mandatory by state law. Large centers of population would be looked on as but the multiplication of units of 100,000, and the equipment would be multiplied accordingly. Each unit would be self-governing, but centralized in some central governing board which would establish the uniformity of the work and the prevention of overlapping.

11. **Diabetes Insipidus and Pituitary Body.**—A tuberculous man suddenly developed diabetes insipidus about two years before his death, which was due to pulmonary and laryngeal tuberculosis. At the necropsy a peculiar change in the posterior lobe of the pituitary body was found. The pituitary fossa was not much, if at all, enlarged, but the posterior lobe (pars nervosa) was relatively enlarged in proportion to the anterior lobe (pars glandularis), in fact, almost completely enclosed the anterior lobe, and was of a yellowish-brownish color, the color appearing to spread right into the posterior wall of the pituitary fossa. The substance of the anterior lobe presented the normal glandular structure, but the posterior lobe contained large clumps of large granular cells with small nuclei, which stain deeply with hematoxylin. Their cytoplasm has a granular appearance and many of them take on the sudan III coloration well. In others of these cells, which stain less well with sudan III, the cytoplasm appears to be full of minute crystals, doubtless fatty acid crystals of some kind; and probably it was a transformation of the lipoid droplets into fatty acid crystals that caused these cells to take on the sudan III stain relatively badly. Weber and Schmidt think that these cells, which are possibly of neuroglial origin, may be regarded as one kind of "compound granular cells" (*Körnchenzellen*), the presence of which in considerable numbers forms a feature in various abnormal conditions of the central nervous system. Doubtless the lipoid-containing cells in question gave the posterior lobe substance of the pituitary body in the present case its decided yellowish-brownish pigmentation.

American Journal of Public Health, Boston

December, 1916, VI, No. 12

12 **Psychiatric Clinics in Schools.** J. T. MacCurdy, New York.—p. 1265.
13 Relation of Alcohol and Syphilis to Mental Hygiene. F. E. Williams, Boston.—p. 1272.
14 Relation of Social and Economic Factors to Mental Hygiene. C. M. Campbell, Baltimore.—p. 1278.
15 Registration of Mental Disorders. A. J. Rosanoff, Kings Park, N. Y.—p. 1283.
16 Malaria as Public Health and Economic Problem in United States. J. W. Trask.—p. 1290.
17 New United States Life Tables, Their Purpose and What They Show. J. W. Glover, Ann Arbor.—p. 1298.
18 Pathogenicity and Longevity in Diphtheria Bacilli. F. W. Schofield, Seoul, Korea.—p. 1303.
19 Refuse and Garbage Disposal; General Survey. L. L. Tribus, New York.—p. 1307.
20 Standard Methods of Bacteriologic Analysis of Milk. M. P. Ravenel.—p. 1315.
21 Bibliography of Tuberculosis in Its Relation to House Infection and Housing Betterment. J. Ford, Cambridge, Mass.—p. 1326.

Boston Medical and Surgical Journal

December 28, 1916, CLXXV, No. 26

22 *Diagnosis and Clinical Characteristics of Gout. J. H. Pratt, Boston.—p. 925.
23 *Anaphylactic Action of Cereal Grain on Respiratory Tract. J. A. Turnbull, Boston.—p. 931.
24 Routine Mental Tests as Proper Basis of Practical Measures in Social Service. H. M. Wright, Boston.—p. 934.
25 Multiple Primary Heterogeneous Tumors; Case of Two Primary Malignant Tumors, One of Kidney, Other of Stomach with Metastases from Each in Liver. S. Graves, Louisville, Ky.—p. 949.

January 4, CLXXVI, No. 1

26 Abdominal Pain. H. Jackson, Boston.—p. 1.
27 Beneficial Results of Prenatal Work. M. M. Davis, Jr., Boston.—p. 5.
28 *Studies of Stomach in Syphilis. F. W. White, Boston.—p. 11.
29 Results Obtained by Class Method of Home Treatment in Pulmonary Tuberculosis During Period of Ten Years. J. H. Pratt, Boston.—p. 13.
30 Correlation Between Systolic Blood Pressure and Reflex Vasoconstriction of Skin (Anemic Dermography). E. A. Tracy, Boston.—p. 15.
31 Report of Dietary Study of St. Paul's School, Concord, New Hampshire. F. C. Gephart, New York.—p. 17.
32 Adenomyoma of Rectovaginal Septum; Report of Case. F. S. Kellogg, Boston.—p. 22.

22. **Diagnosis and Clinical Characteristics of Gout.**—One should always be suspicious, says Pratt, that an attack of acute febrile inflammation of the joints occurring after the age of 35, in a person who has never had a previous attack of rheumatic fever, is not rheumatism, but gout. Acute endocarditis, which is such a common complication of rheumatic fever, does not occur in gout. Another aid to differential diagnosis is the frequent association of gout and chronic interstitial nephritis, and the rarity of acute rheumatism and chronic Bright's disease in the same person. Some of the cases of polyarticular gout Pratt has studied have closely simulated rheumatism. In one case the correct diagnosis was not made by the eight or ten physicians who had treated the patient during the twenty-seven years that he had suffered from recurrent attacks of gout. All had regarded the disease as rheumatic fever. Pratt did not feel sure of the diagnosis until he saw the swelling on his elbow, which presented the typical picture of a chronic gouty olecranon bursitis. The prompt relief from pain produced by colchicum in gout is so striking that many have asserted that this drug is a specific in gout. It is certainly an aid in diagnosis, as colchicum does not have such a marked effect in relieving the pain in acute rheumatism or in other conditions which may be confounded with gout. Salicylates rarely have any marked effect in controlling the pain of acute gout. The relief from the severe pain of gout by atophan is even more striking than that produced by colchicum. Its value in diagnosis is probably less, as it often

is of considerable aid in checking the pains of nongouty arthritis.

23. **Anaphylactic Action of Grains on Respiratory Tract.**—Turnbull demonstrates the cutaneous reaction produced by proteins of wheat, barley, oats, corn and rice, and the anaphylactic action of the proteins of these grains, especially wheat, on the respiratory tract. He has taken wheat as a standard, on account of its frequent and common use in daily diet. He has obtained reactions to wheat in 100 cases. A series of cases giving wheat reactions were tested with yeast; in no case was the reaction obtained. One would thus form the conclusion that the yeast which enters in the making of bread has no anaphylactic action. A series of pollenosis cases showed skin reactions to grain as follows: wheat 100 per cent., barley 66 per cent., oats 64 per cent., rice 82 per cent., corn 90 per cent. On the other hand, not all grain cases showed skin reactions to pollen of trees and plants. Many pollenosis patients who avoided bread and boiled cereals, and used as substitutes those high, dry heated prepared cereals, to which they were not sensitive, found their symptoms diminished. Pollenosis cases were desensitized in less time when eating these prepared cereals to which they were not sensitive.

28. **Studies of Stomach in Syphilis.**—In a group of 600 cases of syphilis with strongly positive Wassermann reactions were found forty-four with prominent stomach symptoms, after excluding patients with hepatic cirrhosis, gumma of liver, nephritis and tabes. In thirty-five cases no definite lesion of the stomach was proved, in nine actual syphilitic or coincident lesions were found (ulcer, gumma or cancer). Two cases were proved cancer at necropsy, five patients had ulcer, syphilitic or coincident, two had syphilitic induration or gumma. The results of treatment are usually prompt and striking; the majority improve, even patients with severe complications like stenosis, perforation and hemorrhage. A good portion are cured, but a small group do badly in spite of thorough treatment. Gummas and induration melt away, but scar tissue does not dissolve and some deformity usually persists in the cases with gastric lesions. Gastric secretion may remain absent after symptoms have disappeared. In the thirty-seven cases without definite stomach lesion sixteen (43 per cent.) are well; eighteen (48 per cent.) improved and three (9 per cent.) no better. In seven cases with stomach lesions (omitting the two cancer cases) three (43 per cent.) are well, and four (57 per cent.) greatly improved.

Cleveland Medical Journal

November, 1916, XV, No. 11

33 Individuality of William Harvey. J. J. R. Macleod, Cleveland. —p. 687.
34 Drainage in Hydrocephalus; Report of Case. A. Peskind, Cleveland.—p. 693.
35 Encephalocele; Report of Case. A. Peskind, Cleveland.—p. 700.
36 Trauma as Factor in Cause of Hydronephrosis. F. C. Herrick, Cleveland.—p. 704.

Journal of Experimental Medicine, Baltimore

January, XXV, No. 1

37 *Details of Photographically Recorded Venous Pulse in Auricular Fibrillation. W. L. Niles and C. J. Wiggers, New York.—p. 1.
38 *Significance of Diastolic Waves of Venous Pulse in Auricular Fibrillation. C. J. Wiggers and W. L. Niles, New York.—p. 21.
39 Spirocheta Morsus Muris, N. Sp., Cause of Rat Bite Fever. K. Futaki, I. Takaki, T. Taniguchi and S. Osumi, Tokyo, Japan. —p. 33.
40 Experimental Rat Bite Fever. K. Ishiwara, T. Ohtawara and K. Tamura, Tokyo, Japan.—p. 45.
41 *Action of Digitalis in Pneumonia. A. E. Cohn and R. A. Jamieson, New York.—p. 65.
42 *Control of Strychnin Convulsions by Intraspinal Injections of Magnesium Sulphate. E. C. Cutler and B. H. Alton, Boston. —p. 83.
43 Metabolism of Cells in Vitro. Toxicity of a-Amino-Acids for Embryonic Chicken Cells. M. T. Burrows and C. A. Neymann, Baltimore.—p. 93.
44 *Production of Arteriosclerosis and Glomerulonephritis in Rabbit by Intravenous Injections of Diphtheria Toxin. C. H. Bailey, San Francisco.—p. 109.
45 *Extirpation of Thymus in Guinea-Pig. E. A. Park, Baltimore. —p. 129.
46 *Experimental Studies on Relation of Pituitary Body to Renal Function. K. Motzfeldt, Boston.—p. 153.
47 *Phagocytic Power of Connective Tissue Cells. F. S. Jones and P. Rous, New York.—p. 189.

37. **Venous Pulse in Auricular Fibrillation.**—The systolic and diastolic waves of the venous pulse of twenty-five clinical cases of auricular fibrillation, recorded by photographic methods, were studied by Niles and Wiggers. Six types of systolic waves were found: (1) an intensified impact wave, the most common and often the only characteristic feature, indicating vigorous ventricular action; (2) a peaked impact followed by a rapid systolic drop due to light pressure of the tambour; (3) the intra-auricular type of systolic variation, so-called from its resemblance to intra-auricular pressure curves found in animals, occurring in clinical cases only when ventricular systole is weak; (4) double systolic waves, attributed to a systolic tug of the ventricle on the auricles and large veins; (5) a systolic impact followed by a stasis wave, present when intravenous pressure is high; (6) a regurgitation wave composed of a steep rise continued into a systolic plateau with murmur vibrations superimposed. The study showed (1) that tricuspid regurgitation, as indicated by the presence of regurgitation waves, is a rare accompaniment of auricular fibrillation; and (2) that the contrary opinion, arrived at by the frequent presence in polygraph tracings of ventricular types of waves, is due to the fact that the contour of intensified impact waves is distorted by polygraph levers so that they simulate regurgitation waves. Recurrent diastolic waves were frequently present in the records. Their relative size depended, to a considerable extent, on the pressure of the tambour. There was no constant relation to similar waves in the recorded electrocardiogram, nor is it proved that they are indicative of a coarse type of fibrillation or an associated flutter.

38. **Diastolic Waves of Venous Pulse.**—The conviction has grown that finer and coarser types of auricular movement may be recognized by the amplitude of the diastolic waves of the electrocardiogram and venous pulse. The investigation into the cause of these waves made by Wiggers and Niles has shown that this is not possible. The large recurrent waves of the venous pulse, which may with more reason be regarded as related to the size of the auricular mechanical contractions on theoretical grounds, are also shown to be without differential value.

41. **Action of Digitalis in Pneumonia.**—In a series of 105 cases of pneumonia studied by Cohn and Jamieson they found that digitalis given by the mouth has an action on the heart, because changes occurred in the auriculoventricular conduction time and in form of the T wave of the electrocardiogram, just as they do in the nonfebrile heart. This conclusion is strengthened by finding that the pulse rate in fibrillating and fluttering cases fell in the presence of fever, exactly as it does in nonfebrile cases. The dose and the time required to produce these effects are given and are the same as in the nonfebrile cases. The authors conclude that digitalis acts during the febrile period of pneumonia. It produces a beneficial, possibly a life saving effect in cases of auricular irregularity (fibrillation and flutter).

42. **Control of Strychnin Convulsions.**—The results obtained by Cutler and Alton in a human case and in animal experiments lead them to believe that magnesium sulphate may be of use in controlling cases of poisoning by strychnin. The amount of magnesium sulphate to be used should follow the advice of Meltzer in tetanus cases; intraspinally 1 c.c. of a 25 per cent. solution to each 20 pounds of body weight in adults, and one half the dose in young children. Should this not control the convulsions, a small amount of ether may be used. In order to hasten the excretion of strychnin, 200 to 300 c.c. of salt solution should be given intravenously. In the event of the return of the convulsions, the intraspinal dose may be repeated, always taking precautions to keep the head elevated. Meltzer's apparatus for intrapharyngeal insufflation and a 2.5 per cent. solution of calcium chlorid should always be on hand in case of respiratory failure following an overdose of the magnesium salts.

44. **Arteriosclerosis and Glomerulonephritis.**—Diphtheria toxin, given in large doses intravenously, Bailey found produces in the kidneys of the rabbit a pronounced vascular and parenchymatous degeneration. The former consists of a swelling and desquamation of the endothelial cells of the

arterioles and small veins with the formation of fibrinous thrombi, a necrosis and thrombosis of the capillaries of the tufts with hemorrhage and the formation of fibrinous and hyaline masses, and in some of the affected glomeruli, considerable collections of polymorphonuclear leukocytes.

45. **Extirpation of Thymus in Guinea-Pig.**—Extirpation of the thymus in the guinea-pig produced no changes in Park's experiments because accessory lobes of thymus derived from the third pharyngeal pouch, occurring in close association with the parathyroids from the third pouch, were found in serial section of the cervical tissues of eleven out of fourteen guinea-pigs, and the author thinks that they probaby would have been found in all fourteen but for a technical error. The discovery of these accessory lobes makes it certain that the guinea-pig is unsuitable material for complete thymectomy, and probably complete extirpation of the thymus in this animal is rarely, if ever accomplished.

46. **Pituitary Body and Renal Function.**—Extracts of the pars intermedia and posterior lobe of the hypophysis, given by the mouth, subcutaneously, or intravenously, Motzfeldt says, are able definitely to check artificially induced polyuria. Extracts of the anterior lobe show a similar effect, but only to a slight degree. This antidiuretic effect is constant, and is independent of (*a*) changes in blood pressure, (*b*) intestinal absorption, and (*c*) the vagi. The effect is apparently prevented or delayed by division of the splanchnics, and is diminished by division of the renal nerves near the hilus. These facts tend to suggest that the antidiuretic action exerted by pituitary extracts on rabbits is caused by stimulation of the sympathetic nervous system, and that the renal vasomotor system in this respect is of chief importance. Clinically these conceptions bring the polyurias related to disorders of the nervous system and the polyurias of pituitary origin in closer contact.

47. **Connective Tissue Cells.**—By the tryptic digestion of cultures in vitro of avian and mammalian connective tissue, suspensions of individual, living cells have been obtained. Their ability to phagocyte carmin and bacteria has been tested. The great majority of them fail to take up either, but a few large cells are able to do so. They will ingest bacteria only when serum is present; that is, they require the interaction of opsonins. There is good reason to suppose that the phagocyte cells are endothelial in nature. Should they prove to be fibroblasts, like the other elements present, the fact will remain that the phagocytic power of fibroblasts is practically negligible. Their failure to ingest foreign matter in vivo is to be laid not to the obstacles offered by the solidity of the tissue they compose, but to an inherent lack of ability on their part. The phagocytosis of blood pigment, bacteria, etc., which takes place in granulation tissue in vivo is probably carried on wholly by endothelial cells and wandering cells.

Journal of Infectious Diseases, Chicago

January, XX, No. 1

48 Comparison of Methods for Disinfecting Swimming Pools. W. A. Manheimer, New York.—p. 1.
49 Various Methods for Determining Trypanocidal Activity of Substances in Vitro and Their Relation to Chemotherapy of Experimental Trypanosomiasis. J. A. Kolmer, J. F. Schamberg and G. D. Raiziss, Philadelphia.—p. 10.
50 Adaptation of Parasitic Micro-Organisms to Lowered Oxygen Tension. W. B. Wherry and W. W. Oliver, Cincinnati.—p. 28.
51 Numeric Relationship of Infection to Chemotherapy of Experimental Trypanosomiasis. J. A. Kolmer, J. F. Schamberg and G. D. Raiziss, Philadelphia.—p. 35.
52 *Studies of Beta Hemolytic Streptococcus Septic Sore Throat (Smith and Brown). W. G. Smillie, Boston.—p. 45.
53 Bacteriology of Pemphigus Neonatorum. F. H. Falls, Chicago.—p. 86.
54 Studies on Immunity in Typhus Exanthematicus with Reference to Antibodies in Man and Guinea-Pig Demonstrable by Dale Method. B. S. Denzer and P. K. Olitsky, New York.—p. 99.
55 Small Contact Epidemic of Typhoid. M. F. Boyd, Iowa City, Iowa.—p. 109.
56 *Etiology of Acute Epidemic Poliomyelitis. G. Mathers, Chicago.—p. 113.

52. **Beta Hemolytic Streptococcus.**—The throats of individuals who have had tonsillitis, Smillie says, may harbor the beta hemolytic streptococcus for three or more months after acute symptoms of the disease have subsided. This streptococcus is found in large numbers in the throats of a certain proportion of patients with sporadic tonsillitis (five of twenty studied). Epidemic tonsillitis, or septic sore throat, is, therefore, not a disease due wholly to the drinking of contaminated milk. The disease may exist not only in the epidemic, but in the sporadic form. Tonsillitis, epidemic and sporadic, due to the streptococcus of the beta hemolytic type, may be severe or moderate, or even mild. The beta streptococcus is frequently found in the throats of patients ill with acute scarlet fever, and may remain for months in the purulent discharges in the cases complicated by otitis media, etc. These facts explain how the discharges from a scarlet fever patient may contaminate a milk supply and produce a milk-borne epidemic, not of scarlet fever, but of septic sore throat.

56. **Etiology of Acute Epidemic Poliomyelitis.**—In a bacteriologic examination of fresh material from ten cases of acute poliomyelitis a peculiar polymorphic streptococcus-like organism has been isolated in nine instances, in seven of which the growth has been pure. Similar organisms have been demonstrated microscopically in the tissues of the central nervous system of these patients. Cultures of this coccus injected into rabbits have produced paralysis of various groups of muscles, and characteristic lesions in the central nervous system, consisting of hyperemia and edema of the tissues, with hemorrhages, round cell perivascular infiltration and neurophagocytosis in the spinal cord, especially in the gray substance, similar in every detail to the changes considered characteristic of acute poliomyelitis in man. This micrococcus has been recovered from the lesions in the inoculated rabbits by both cultural and microscopic methods.

The artificial cultivation of the poliomyelitis coccus in an ascites fluid tissue medium under anaerobic conditions causes changes in the medium which cannot be differentiated from those previously described for cultures of the so-called virus of poliomyelitis. Morphologically, also, this bacterium when grown on the same mediums is similar to the virus, and in stained smears it appears in minute gram-positive coccus-like bodies arranged in pairs, groups and chains. These minute forms disappear when the organism is cultivated in other mediums under aerobic conditions. The morphologic, cultural and pathogenic characters of the poliomyelitis coccus thus far determined indicate that it is an important factor in the disease.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

December, 1916, IX, No. 3

57 Rôle of Liver in Acute Polycythemia. Effect of Shutting Off Arterial Blood Supply to Liver, Reaction of Normal Animal to Epinephrin and Removal of Liver from Circulation. P. D. Lamson, Baltimore.—p. 129.
58 Can Epinephrin Acquire Antineuritic Properties? C. Voegtlin and and G. F. White, Washington, D. C.—p. 155.
59 Action of Strychnin on Certain Invertebrates. A. R. Moore, Woods Hole, Mass.—p. 167.
60 Pharmacology of Uterus Masculinus. J. A. Waddell, Charlottesville, Va.—p. 171.
61 Pharmacology of Prostate. J. A. Waddell, Charlottesville, Va.—p. 179.
62 *Effects of Drugs on Ileocolic Sphincter. M. Kuróda, London.—p. 187.
63 *Pharmacology of Ureter. Action of Opium Alkaloids. D. I. Macht, Baltimore.—p. 197.

62. **Effects of Drugs on Ileocolic Sphincter.**—The effects of atropin, pilocarpin, nicotin and cocain on the sphincter are very similar to those on the intestine in general. Yet the innervation of the sphincter is entirely different from that of the intestine, in which the vagus is the augmentor, the splanchnic the depressor nerve, while in the sphincter the splanchnic is augmentor and no inhibitory nerve has been shown to exist. The correspondence in the action of these drugs on parts which are so different, suggests strongly that the seat of their activity is not the nervous apparatus, but the muscular. And this is strengthened by the fact that epinephrin has an action on the sphincter opposite from that in the intestine in general, thus changing along with the character of the nervous activity.

63. **Pharmacology of Ureter.**—Morphin and its allied alkaloids increase the contractions and produce a greater

tonicity of the ureter. Papaverin and its allied alkaloids produce a slowing or total inhibition of the contractions and a relaxation of the tonus. In pantopium (total opium alkaloids) and other combinations, the effect of the benzyl-isoquinolin alkaloids predominates. In spasmodic conditions of the ureter (renal colic), Macht says, the employment of papaverin or total opium alkaloids is more rational than that of morphin alone. The slight toxicity of papaverin, its tonus lowering power, and its local analgesic properties suggest its local application in spasmodic conditions of the ureter.

Kentucky Medical Journal, Bowling Green

January, XV, No. 1

64 Comprehensive Plan for Cooperation of State Tuberculosis Commission with Existing Health Agencies. W. L. Heizer, Bowling Green.—p. 5.
65 Training Physicians for Social Health Work. P. E. Blackerby, Erlanger.—p. 9.
66 Prostatectomy; Its Indications. P. H. Stewart, Paducah.—p. 12.
67 Simple Modification of Milk for Baby. D. H. McKinley, Winchester.—p. 17.
68 *Acute Bacterial Synovitis. J. G. Sherrill, Louisville.—p. 21.
69 Forceps Delivery. H. E. Prather, Hickman.—p. 24.
70 Present Treatment of Puerperal Infection. J. B. Lukins, Louisville.—p. 25.
71 Lessons from Life of Physician Incognito—Appeal to Young Men. J. W. Crenshaw, Cadiz.—p. 34.
72 *Significance of Abdominal Pain in Children. J. D. Trawick, Louisville.—p. 37.
73 Some of Duties We Owe to County Society. W. R. Burr, Auburn.—p. 40.
74 Unacknowledged and Uncanceled Debt of Obligation of Public to Medical Profession. G. Cowan, Danville.—p. 42.

68. and 72. Abstracted in THE JOURNAL, Dec. 2, 1916, pp. 1692 and 1693.

Maine Medical Association Journal, Portland

December, 1916, VII, No. 5

75 Medical Cult Absurdity. A. P. Leighton, Jr., Portland.—p. 141.
76 Some Medical Aspects of Naval Recruiting. J. H. Harris, Portland.—p. 149.
77 Adenoids as Factor in Amblyopia. C. T. Adams, Trenton, N. J.—p. 164.

Medical Record, New York

December 30, 1916, XC, No. 27

78 Sensitized Typhoid Bacteria. (Typhoid Serobacterins). A. L. Garbat, New York.—p. 1145.
79 Diathermia in Treatment of Trifacial Neuralgia; Report of Cases. H. F. Wolf, New York.—p. 1152.
80 Employment of Persons in Arrested Stage of Tuberculosis. J. S. Ford, Wallingford, Conn.—p. 1154.
81 Hematuria and Pyuria. S. W. Schapira, New York and J. Wittenberg, Brooklyn.—p. 1156.
82 Rhinal Premonstration of Tuberculosis. J. A. Hagemann, Pittsburgh.—p. 1157.

Missouri State Medical Association Journal, St. Louis

January, XIV, No. 1

83 Chronic Induration of Penis; Report of Cases. A. E. Hertzler, Kansas City.—p. 1.
84 Relationship of Laceration of Mouth of Uterus to Cancer of Uterus. R. M. Funkhouser, St. Louis.—p. 4.
85 Nongonorrheal Type of Ophthalmia Neonatorum. J. H. Thompson, Kansas City.—p. 7.
86 Primary Acute Glaucoma. H. Bailey, Springfield.—p. 8.
87 Experimental Measurement of Bones of Foot as Aid to Better Diagnosis and More Rational Treatment. B. Belove, Kansas City.—p. 13.
88 Result of Physical Examination of Five Hundred Young Men. H. T. Price, St. Louis.—p. 20.
89 Case of Perinephritic Abscess with Spontaneous Recovery. T. M. Paul, St. Joseph.—p. 21.
90 Development of Fecal Concretion in Stump Left After Ligating Appendix. L. A. Todd, St. Joseph.—p. 23.
91 Indications and Methods for Removal of Faucial Tonsils. W. D. Black, St. Louis.—p. 24.

Modern Hospital, St. Louis

January, VIII, No. 1

92 Complete Suburban Hospital—Muhlenberg. F. J. Hubbard, Plainfield, N. J.—p. 1.
93 Successful Medical Treatment in Chronic Alcoholism. C. B. Towns, New York.—p. 6.
94 St. Joseph's Hospital, Kansas City, Mo. J. D. Griffith, Kansas City, Mo.—p. 10.
95 Some Facts and Fallacies of Sterilization. A. W. Clark, New Brunswick, N. J.—p. 13.
96 United States Naval Hospital on Island of Guam. L. W. Johnson, U. S. Navy.—p. 16.
97 Cost of Operating Motor Ambulance. W. Fawcett, Washington, D. C.—p. 21.
98 Story of New England County Hospital. J. M. French, Milford, Mass.—p. 26.
99 Small Community Hospital—Equipment. J. A. Hornsby, Chicago.—p. 29.
100 Necropsies—Their Value, Methods of Obtaining and Protection of Hospital. M. C. Winternitz, Baltimore.—p. 36.
101 What the Intern Should Contribute to Team Work. E. H. Beckman, Rochester, Minn.—p. 43.

New Mexico Medical Journal, Las Cruces

December, 1916, XVII, No. 3

102 Early Symptoms of Upper Abdominal Disease. H. A. Black, Pueblo, Colo.—p. 66.
103 Parotitis Secondary to Suppurative Appendicitis. F. W. Noble, Tucumcari.—p. 73.
104 Country Surgeon. J. W. Wroth, Albuquerque.—p. 80.

New York Medical Journal

December 30, 1916, CIV, No. 27

105 Dental Infections in Systemic Disorders. S. Tousey, New York.—p. 1269.
106 Eczema in Children. G. W. Crary, New York.—p. 1274.
107 Infections of Bones and Joints. P. W. Roberts, New York.—p. 1275.
108 Diathermia. H. Wolf, New York.—p. 1276.
109 Eye Strain. I. Hartshorne, New York.—p. 1279.
110 New Method for Intraspinous Treatment of Neural Syphilis with Mercury. M. F. Lautman, Hot Springs, Ark.—p. 1281.
111 Fallacy of Fallacies About Tuberculosis. A. Robin, Wilmington, Del.—p. 1284.
112 Rôle of Syphilis in Insane Negro. L. Wender, Washington, D. C.—p. 1286.

Oklahoma State Medical Association Journal, Muskogee

January, X, No. 1

113 Intestinal Stasis. V. C. Tisdal, Elk City.—p. 1.
114 Varicose Veins, Their Results and Treatment. R. M. Howard, Oklahoma City.—p. 3.
115 Abdominal Drainage from Anatomic Standpoint. C. von Wedel, Jr., Oklahoma City.—p. 7.
116 Rachiocentesis. L. Riely, Oklahoma City.—p. 10.
117 Perforation in Typhoid. L. Long, Oklahoma City.—p. 12.
118 Study of Teratology, with Presentation of Specimen. W. W. Wells, Oklahoma City.—p. 16.
119 Laryngeal Diphtheria. H. M. Williams, Wellston.—p. 20.
120 Gonorrheal Ophthalmia. R. L. Mitchell, Vinita.—p. 23.

Ophthalmic Record, Chicago

January, XXVI, No. 1

121 Clinical and Pathologic Study of Two Cases of Miliary Tubercles of Choroid. R. L. Randolph and H. C. Schmeisser, Baltimore.—p. 1.
122 New Method of Treatment for Retinal Separation. F. H. Verhoeff, Boston.—p. 10.
123 Bicylindric Refraction. C. F. Prentice, New York.—p. 14.
124 Explosion of Snellen Eye in Orbit; Report of Case. W. B. Weidler, New York.—p. 19.
125 Treatment of Corneal Ulcers. S. G. Dabney, Louisville, Ky.—p. 21.
126 In Re Corneal Ulcers. H. B. Young, Burlington, Iowa.—p. 25.

Public Health Journal, Toronto

December, 1916, VII, No. 12

127 Feeblemindedness. H. L. Brittain.—p. 495.
128 Attitude of Educator toward Feebleminded. P. Sandiford.—p. 496.
129 Attitude of Neighborhood Worker. M. J. Clarke.—p. 498.
130 Problem of Feebleminded from Institutional Viewpoint. L. W. Brooking.—p. 500.
131 Psychiatric Clinic. C. M. Hincks.—p. 502.
132 General Considerations. C. K. Clarke.—p. 504.
133 Care of Feebleminded. F. J. Conboy.—p. 505.

Rhode Island Medical Journal, Providence

January, I, No. 1

134 Lateral Curvature of Spine (Scoliosis). F. E. Peckham, Providence.—p. 13.
135 Initial Experiences in Office of State Pathologist. H. S. Bernstein, Providence.—p. 5.
136 Pelvic Descent of Appendix into Pelvis. W. L. Harris, Providence.—p. 13.

Vermont Medicine, Rutland

December, 1916, I, No. 12

137 Treatment of Diabetes Mellitus. J. R. Williams, Rochester, N. Y.—p. 341.
138 What Shall We Feed the Sick? C. J. Rumrill, Randolph.—p. 348.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

December 16, 1916, II, No. 2920

1 Mechanical Treatment of Fractures Under War Conditions. R. Jones.—p. 829.
2 How to Use Crutches to Prevent Primary Contraction. Hagentorn. —p. 834.
3 *Pseudotuberculoma Silicoticum of Lip. C. R. Nitch.—p. 835.
4 *Second Primary Growths in Remaining Breast After Amputation of Other for Carcinoma. D. Drew.—p. 836.
5 *Organism Present in Blood of Patients Suffering from Trench Nephritis. R. L. Thornley.—p. 836.

3. **Pseudotuberculoma Silicoticum of Lip.**—A man fell off his bicycle when riding along a dusty country road, cutting the mucous membrane on the buccal aspect of his lower lip. Some road grit was ground into the wound. Healing took place in about fourteen days. The resulting scar was somewhat thickened, but underwent no further change until a swelling began to form in its center. Four months later the submental glands became enlarged and tender. The glandular enlargement combined with the deformity of the lip produced by the increasing size of the tumor, led the patient to consult his physician. Palpation of the tumor through the skin conveyed an impression similar to that given by a preputial chancre. A provisional diagnosis of an endothelioma or of a fibroma surrounding a foreign body was made. The tumor, together with the mucous membrane covering it and a quarter of an inch of the surrounding tissues, was excised from the buccal aspect of the lip, and the submental glands were removed. Healing was uneventful. Microscopic examination showed that the lesion consisted of a congeries or a mosaic of giant celled systems and huge giant cells, hardly to be distinguished from those of tuberculosis, although no caseation was present. No tubercle bacilli or other bacteria were discoverable in the lesion in microscopic sections. In practically all the giant cells, however, and elsewhere, there were particles of silica, which stood brilliantly out when the sections were polarized. That the material consisted chemically of silica was proved by its insolubility in boiling nitric acid.

4. **Second Primary Growths in Remaining Breast After Amputation of Other for Carcinoma.**—Drew says that in his experience it is extremely rare to find a second solitary growth developing in the remaining breast after the lapse of two or three years, the patient being in good health and careful examination failing to reveal any evidence of secondary deposits in any other region.

5. **Organism Present in Blood of Patients Suffering from Trench Nephritis.**—With one single exception, every one of twenty-seven cases of trench nephritis examined by Thornley has shown the presence of an identical coccus in the blood. Examined under the highest powers, the organism is seen to be an extremely minute diplococcus, with adjacent surfaces flattened against each other. It is usually seen singly or in groups, seldom in chains. They are nonmotile, have no capsules and do not stain. It grows readily, on ordinary agar, as a fine growth not unlike *Micrococcus melitensis*. It does not liquefy gelatin, on which it grows readily. It ferments glucose, lactose, mannite, sorbite and saccharose within forty-eight hours, but not dulcite. There is no formation of gas in any of the sugars. Agglutination tests performed against it with meningococcic and *M. melitensis* antiserums were negative in a dilution of 1 in 10.

Lancet, London

December 16, 1916, II, No. 4868

6 Injuries of War. A. M. Sheild.—p. 1003.
7 Electric Treatment of Wounded. W. J. Turrell.—p. 1005.
8 Fraud and Skin Eruptions. J. Collie.—p. 1008.
9 *Case of Meningococcal Infection without Involvement of Cerebrospinal System. W. M. Elliott.—p. 1010.
10 Method of Hydrogen-Ion Concentration Differentiation of Typhoid and Paratyphoid Bacilli A and B. S. W. Cole and H. Onslow. —p. 1011.
11 *Diffuse Myxochondroma of Long Bone. M. McIntyre.—p. 1013.
12 Ocular Vertigo. T. E. Harwood.—p. 1014.
13 Case of Aneurysm at Termination of External Carotid Artery. R. F. Bolt.—p. 1015.
14 *Rare Congenital Malformation. W. F. Stiell.—p. 1015.

9. **Meningococcal Infection.**—The case cited by Elliott presented the features of an acute febrile condition accompanied by a very definite exanthem, the acute symptoms ending by crisis on the sixth day of illness. In reviewing the facts obtainable, Elliott is convinced that the patient had suffered from an infection by the meningococcus without involvement of the cerebrospinal system and that the case falls into the so-called septicemia class of cerebrospinal fever. The patient had specific antibodies to the meningococcus in his serum. Attempts were made to obtain the organism in culture from the nasopharynx, but they were unsuccessful.

11. **Diffuse Myxochondroma of Long Bone.**—A female, aged 65 years, for seven and a half years complained of slight discomfort in the upper part of the right thigh without swelling, so far as she was aware, till shortly before her admission to the hospital. At that time there was a visible fullness of the upper third of the right thigh, which felt as if due to a hard nodular enlargement of the femur, in the neighborhood of the great trochanter. Passive movements at the hip joint were not impaired, the temperature was normal, the patient's past history was negative, there was no evident metastasis, and the general health was unaffected. Her single complaint was the increasing discomfort, amounting at times to actual pain, in the upper part of the right thigh. On the roentgenogram general enlargement of the upper third of the femur was evident, consisting of tissue less dense than the imperfect shell or case of compact bone. It appeared to be a central sarcoma, causing expansion with thining of the compact bone, for which the limb was disarticulated at the hip. In commencing the operation an incision was first made into the tumor, when a hemorrhagic friable tissue escaped, supporting the presumption that the condition being dealt with was as diagnosed.

14. **Rare Congenital Malformation.**—The condition is bilateral in Stiell's case. The total length of the upper extremity from the tip of the coracoid process to the tip of the longest digit is 7 inches. Muscular development is excellent. The elbow joint itself is entirely absent, but this is compensated by an abnormally efficient range of movement at the shoulder joint, while the mobility at both the wrist and interscapulothoracic joints is quite pathologic. The radius and the ulna are entirely absent and the carpus is represented solely by the unciform, os magnum, trapezoid, and one quite abnormal bone, probably a glorified scaphoid. The metacarpal bones of the thumb and index finger are absent, as also the corresponding digits to these bones. The three existing digits are held in the semiflexed position chiefly by contraction of the flexor tendons. There is no syndactylism. The humerus is represented by a short stout bone about 4 inches in length which articulates with a very abnormal scapula at its upper end and directly with the freak carpus at its lower. Notwithstanding the total absence of both the radius and ulna, there is a normal range of pronation and supination, provided apparently by an exaggerated rotatory movement of the head of the humerus in the glenoid fossa. With the exception of the upper extremities the remainder of the skeleton is normal. There is no trace of any mental impairment.

Practitioner, London

December, 1916, XCVII, No. 6

15 Venereal Diseases as We See Them Today. J. E. R. McDonagh. —p. 501.
16 Keratodermia Blenorrhagica; Report of Cases. E. G. Little.—p. 531.
17 Sanatorium Treatment of Industrial Patients. I. S. Stewart.—p. 554.
18 Placebo; Protest and Plea. S. Noble.—p. 568.
19 *Tendon Repair without Actual Suture. W. F. Stiell.—p. 574.
20 Case of Boric Acid Poisoning. G. C. Maguire.—p. 580.
21 *Sublingual Medication. A. P. Murtz.—p. 582.
22 *Pain Caused by Dilatation of Deep Veins of Thighs. J. R. Keith. —p. 584.

19. **Tendon Repair Without Actual Suture.**—In following the treatment for accidental division of tendon without actual suture, Stiell says, it is essential that four important details should all be present at one and the same time. 1. It is of the utmost importance that the injured finger should be maintained in a position of hyperextension for at least three

weeks. 2. It is necessary that the actual skin cut should have fairly close approximation of its edges, or, at least, the laceration must not be too extensive to render good apposition possible by means of skin stitches only. 3. It is inadvisable to employ any form of drainage whatever for two reasons: first, because it tends to remove the very necessary and beneficial blood clot from between the ends of the divided tendon, and second, that it only provides one more possible entrance for micro-organisms. 4. Absolute asepsis is essential, or at least asepsis as regards the tendon sheath itself. If these four important points in the method of technic are strictly observed, and the tendon sheath remains aseptic, primary union will invariably occur between the divided ends of the tendon without any actual tendon suture whatever.

21. **Sublingual Medication.**—The sublingual method of medication is endorsed by Murtz, who has used it for twenty years. He regards the sublingual space the place par excellence for the rapid transmission by absorption of crushed hypodermic tablets into the circulation.

22. **Pain Caused by Dilatation of Deep Veins of Thighs.**—A woman, 57 years of age, about two years ago, began to be troubled with pain and swelling in the thighs. These symptoms gradually increased, being produced by walking or standing and relieved by lying down. Always absent in the morning on rising; in about an hour afterward they invariably made their appearance. On examination, no objective signs were found to indicate the pathology of the condition, but, as speedy relief was afforded by the application of elastic support it was evident that the symptoms arose from dilatation of the deep veins of the thighs.

Annales de Gynécologie et d'Obstétrique, Paris

1916, XLII, No. 2, pp. 65-128

23 Welfare Work for Children in Paris District during the First Year of the War. A. Pinard.—p. 65.
24 After the Laparotomy. E. Forgue.—p. 79. Commenced in No. 1, p. 1.
25 Mechanism of Menstruation. H. Vignes.—p. 104. Commenced in No. 1, p. 25.

No. 4, pp. 193-256

26 *Abortive Gangrene of the Uterus. P. Mauclaire.—p. 193.
27 *Perforation of Uterus with Passage of Foreign Bodies into the Abdominal Cavity. V. B. Beckman.—p. 206.
28 *Obstetrics in France and in Germany. (Puériculture. Obstétricie française et obstétricie allemande.) A. Pinard.—p. 213. Commenced in No. 3, p. 129.
29 Case of True Hermaphroditism. C. Walther.—p. 230.

26. **Gangrene of the Uterus from Measures to Induce Abortion.**—Mauclaire remarks that induced abortion is becoming so common that it is astonishing that serious complications are not more frequently observed as the surgical services are so invaded by patients with febrile postabortion complications. He here describes with illustrations four already published cases of fatal gangrene from this cause, with necropsy. A number of other cases are briefly mentioned, his conclusion being that operative measures offer the only chance for saving the patient, although the conditions are decidedly unfavorable, whether the gangrene is in the fundus or in the cervix.

27. **Perforation of Uterus During Attempt to Induce Abortion.**—Beckman warns that if the physician does not know the circumstances of the case, he may fail to recognize that a foreign body has penetrated through the uterine wall into the abdominal cavity. It was a *laminaria* in one of the two cases described and a bougie in the other. In this latter case the supposed pregnancy was nonexistent; he remarks that this is the forty-sixth case of the kind on record. The prognosis depends in large measure on whether the woman confesses or conceals what she has been doing. At the same time we must remember that women may insist that a foreign body has penetrated the uterus wall when this did not occur. He has had such cases, suggestion and fear prompting the avowal. The surgeon must not take literally all that the patient relates. As a rule, the reverse circumstances prevail; the woman does not know what the midwife has done to her, or she dissembles. It is sometimes possible to palpate the foreign body through the walls of the abdomen, the rectum or the vagina. It may become encysted and feel like a tumor. In the two cases reported there were no signs of peritonitis until the fourth or fifth day, beyond a few vague symptoms. Beckman advises to leave the uterus if there are no signs of infection. Vasten removed a bougie from the abdominal cavity at the third month of a pregnancy which progressed to term. In one case on record the bougie was felt in the Douglas pouch four days after it had penetrated the wall of the six months' pregnant uterus; abortion followed twelve days later. The sixteenth day after this the woman consented to a laparotomy. The bougie then was found between the umbilicus and the costal arch.

28. **Obstetrics in France and Germany.**—This is mainly a historical sketch of the evolution of obstetrics in Europe and of the hygiene of gestation and of puericulture.

Archives de Médecine des Enfants, Paris

October, 1916, XIX, No. 10, pp. 505-560

30 Antitoxin in Treatment and Prevention of Diphtheria and Rarity of Accidents Therefrom. (Les accidents consécutifs aux réinjections de sérum et les injections préventives de sérum antidiphthérique.) A. Netter.—p. 505.
31 *Severe Aplastic Anemia in Two Boys of Six and Three. E. Gorter (Leyden).—p. 525.
32 Myopathy with the Reaction of Myotony in Girl of Thirteen. L. Babonneix.—p. 532.
33 The Mongolian Blue Spot in Chili and Brazil. (La tache bleue mongolique à Santiago de Chili.) L. C. Mackenna.—p. 535; . . . à Sao-Paulo.) G. Ferreira.—p. 536.
34 Belgian Children. (Enfants belges victimes de la barbarie allemande.) J. Comby.—p. 537.

31. **Aplastic Anemia.**—In both the cases described there seemed to be some unknown cause slowly paralyzing the bone marrow. There was no hemolysis to speak of, as was evidenced by the lack of intense urobilinuria and of hemolytic substances. The bone marrow was yellow and there was fatty degeneration of various organs, especially of the liver and heart, but there were no signs of infection as responsible for the syndrome, no endocarditis, in the one case in which necropsy was possible. The family was healthy and the child had never had any serious illness but had always been pale. The pallor had increased suddenly about three weeks before death, and petechiae had developed with fever and vomiting.

Bulletin de l'Académie de Médecine, Paris

December 5, 1916, LXXVI, No. 48, pp. 437-452

35 Frequency of "Hippocrates Finger" among the Troops. (Sur les rapports du psoriasis avec la tuberculose.) Railliet.—p. 439.
36 Peculiar Gravity of d'Hérelle's Dysentery Bacillus. (Sur de nouveaux bacilles dysentériques.) Capitan.—p. 440.
37 Comparative Harmlessness of Surgical Pneumothorax. (Sur l'extraction des corps étrangers extrapulmonaires.) P. Bazy.—p. 441.
38 *Experimental Inversion of Impulse for the Heart Beat. (Production expérimentale d'extrasystoles ventriculaires rétrogrades et de rythme inverse, par inversion de la conduction de l'excitation dans le cœur.) J. P. Morat and Petzetakis.—p. 442.
39 Concretions in Bladder after War Wounds of the Bladder. (Des calculs vésicaux chez les blessés de la vessie.) F. Legueu.—p. 445.
40 Shrapnel Ball Loose in Spinal Canal Extracted through Cauda Equina. M. Auvray.—p. 447.

38. **Experimental Inversion of Impulse for Heart Beat.**—Electric stimulation of points on the surface of the auricle induces extrasystoles in the ventricle, and Morat and Petzetakis have succeeded in inducing extrasystoles in the auricle by electric stimulation of numerous points on the surface of the ventricle. They experimented on dogs that had had the spinal cord severed at about the seventh cervical vertebra, and succeeded in stimulating the ventricle until it contracted each time before the auricle, thus reversing the impulse. They explain that a nonreversible phenomenon may be composed of factors, which in themselves are reversible, and this is evidently the case here.

Paris Médical

December 2, 1916, VI, No. 49, pp. 469-512

41 *Reeducation of Disabled Soldiers. (Rééducations fonctionnelle et professionelle.) J. Camus.—p. 470. (Rééducation fonctionnelle des amputés du membre supérieur pour les travaux de cultivateurs.) Nové-Josserand and Bouget.—p. 479. (Méthodes de rééducation professionnelle des amputés.) Bourrillon.—p. 487. (Rééducation professionnelle d'après les variétés d'impotences.) A. Nyns.—p. 493. (La mécanothérapie agricole.) J. Belot and Privat.—p. 498. (Les écoles de rééducation professionnelle de l'Union des colonies étrangères.) J. Camus.—p. 504.

42 *Reeducation of the Blinded. (Remarques sur la rééducation des aveugles.) F. Terrien.—p. 490.
43 *Responsibility of the Training Schools for Disabled Soldiers in Case of Injury from Accident. (La responsabilité des œuvres de rééducation des mutilés de guerre au point de vue des accidents.) E. Fontane.—p. 496.
44 Roentgen Treatment of Muscular Retraction; Four Cases. M. Mercier.—p. 509.

41. **Reeducation of the Maimed.**—This entire number is devoted to the reeducation of mutilated soldiers. Camus discusses the rôle of the physician. It is to him that all look to decide when and in what the disabled workman should be trained. Camus discusses further the placing of the men after they are trained, perhaps placing together men crippled in legs and arms, their concerted work accomplishing more than either alone. Nové-Josserand and Bouget give an illustrated description of devices in use to facilitate work on farms, showing how the stump of the arm can be utilized.

42. **Reeducation of the Blinded.**—Terrien urges that the blinded should be sent to their homes as soon as possible, as they can get about much better in ways with which they are familiar. A number of blinded soldiers are now usefully at work on farms, attending to the milking of the cows, digging potatoes, beets, etc.; thrashing and making brushes on rainy days. It is indispensable for the blinded to learn to read and write the Braille characters; there are now 40,000 books or pamphlets with this type. A printing set is now available which has the Braille character on one end and the ordinary letter on the other end. The type is set up by any printer with the ordinary letters, but when the form is closed, the printing is done from the other side, thus printing the Braille letters. No other system for the blind has stood the test of time like the Braille characters.

43. **Legal Responsibility of Training Schools for Injury from Accidents.**—Fontane suggests that it might be well for the public and private organizations engaged in training the maimed and blinded to take out accident insurance policies to protect themselves in case of accidents to any of the men in their charge, as legally they are responsible for injury the same as the proprietor of a factory.

Presse Médicale, Paris

December 7, 1916, XXIV, No. 68, pp. 561-568

45 Bone Grafting in Treatment of Pseudarthrosis. (Cure des pseudarthroses par la greffe osseuse.) V. Pauchet.—p. 561.
46 Tuning-Fork Test for Simulated Deafness. (Epreuve des diapasons unissonants appliquée au diagnostic de la surdité unilatérale simulée.) E. Escat.—p. 562.
47 *Tests of Reserve Force of the Heart. (Epreuve d'aptitude cardiaque à l'effort.) C. Lian.—p. 563.

47. Testing the Reserve Force of the Heart.—Lian declares that the mere counting of the pulse after a given physical exercise will reveal whether the heart can be depended on for extra effort or not. His 250 tests, including fifty healthy persons, have amply confirmed that the pulse changes are a good index of the reserve force of the heart. He gives illustrations of the exercises he has found most convenient and instructive for the purpose. The first is gymnastic stepping in one place, bending the knees, two steps a second. This is kept up for a minute. Then the patient stands still without speaking, and the pulse is counted during the first quarter of each minute thereafter until the count is the same as before the exercise. In the healthy this occurs in the third minute; with a weak heart five to seven minutes may be required for it even to approach the previous figure. His second test is to have a weight of 11 pounds seized with both hands and carried above the head and then swung down between the parted and slightly flexed legs which are firmly planted. This is repeated five or six times in the course of a minute, and the pulse is then counted as before.

Progrès Médical, Paris

November 20, 1916, XXXI, No. 22, pp. 213-222

48 *Hemiplegia Following Scarlet Fever. L. Lortat-Jacob and R. Oppenheim.—p. 213.
49 *Traumatic Exophthalmic Goiter. Léniez.—p. 215.
50 Treatment of War Wounds of the Elbow. (Traitement des plaies articulaires du coude dans les traumatismes de guerre.) D. de Fortunet.—p. 217.
51 *Test for Picric Acid in the Blood in Factitious Jaundice. L. Tixier and A. Bernard.—p. 218.

December 5, No. 23, pp. 223-232

52 Symptoms from Contusion of Cervical Spine. (Le syndrome d'hypertension céphalo-rachidienne consécutif aux contusions de la région cervicale de la colonne vertébrale.) H. Claude and H. Meuriot.—p. 223.
53 Relapses in Amebic Dysentery. (Les reviviscences de la dysenterie amibienne.) J. Carles and Froussard.—p. 226.
54 Shrapnel Ball in Hernia. (Balle d'obus enrobée par le grand épiploon et mobile dans un sac herniaire.) L. C. Bailleul.—p. 228.

48. Postscarlatinal Hemiplegia.—The patient in the case described was a soldier who had had a seton wound in the neck three months before. Comparing the symptoms with other cases of postscarlatinal paresis confirms the assumption that cerebral arteritis is responsible for the chronic infectious hemiplegia in such conditions.

49. Traumatic Exophthalmic Goiter.—Léniez reports three cases of typical exophthalmic goiter developing in two army officers and a private after being thrown from a horse or falling from a wagon. Each had fallen on his head, and after intervals of one, two and three months symptoms of hyperthyroidism developed, more or less pronounced. Léniez has encountered also a number of other cases in which trauma had been followed by some symptoms suggesting a tendency to hyperthyroidism, consecutive to injury of the head. The exophthalmos was never pronounced in any of these cases, but the expression of the eyes was peculiar.

51. Detection of Picric Acid in the Blood.—Fifteen drops of the blood are received in a test tube containing 3 c.c. of 0.95 per cent. salt solution. The tube is agitated two or three times in the course of an hour, and set aside for twenty-four hours. Then 1 or 2 c.c. of the fluid surrounding the clot is taken up with a pipet and added to an equal volume of a 1:50,000 solution of methylene blue. Shake vigorously and after an hour's contact add ten or fifteen drops of chloroform and agitate anew, then allow to settle. The chloroform becomes a deep green, a bottle green, if there is picric acid present; otherwise the chloroform does not change its color, or becomes only slightly blue.

Correspondenz-Blatt für Schweizer Aerzte, Basel

December 9, 1916, XLVI, No. 50, pp. 1665-1696

55 *The Present Problems in Roentgen Treatment of Cancer. M. Steiger.—p. 1665.
56 Preparation of Rice Pericarp as Influencing Growth from Its Vitamin Content. (Vitamin und Wachstum.) F. Stirnimann. —p. 1678.
57 *Exfoliating Dermatitis in the Newly Born in Its Relation to Pemphigus. A. Wirz.—p. 1685.

55. Roentgen Treatment of Cancer.—Steiger declares that in his experience the Roentgen rays have proved their usefulness in treatment of myomas, hemorrhagic climacteric uterine trouble, tuberculous glands in the neck—avoiding disfiguring scars—in tuberculous peritonitis and for vulvar and anal pruritus. For cancer he advocates surgical treatment, but makes a practice of Roentgen exposures after every operation for cancer, and also in the inoperable cases. Much progress will be realized, he remarks, when manufacturers provide us with Roentgen tubes that will stand a second's tension of 200,000 volts instead of only 120,000 as now available. Aluminum does not seem to be a heavy enough metal for filtering the rays. He is now using a zinc filter 0.5 mm. thick. This holds back the soft rays in much larger measure than even 3 mm. aluminum, while it yields much more of the hard rays. It has thus two great advantages over aluminum, it spares the skin better and penetrates better and deeper into the tissues than is possible with the aluminum filter. The cancer was favorably influenced in about 30 per cent. of his fifty malignant tumors, including twenty-six absolutely inoperable cases. Three patients in this latter group have kept in good health since for nearly a year to date. In thirty-four cases the Roentgen exposures were only for prophylactic purposes. In this category is the case of a woman who had required several operations for a sarcoma of the abdominal wall, but has been free from recurrence during

the two years since the last operation. In this interval she has passed through a twin pregnancy.

57. **Exfoliating Dermatitis in Relation to Pemphigus.**—Wirz cites literature showing an unmistakable connection between exfoliating dermatitis and pemphigus in infants, and reports an additional convincing experience. A 5-day old infant developed the exfoliating dermatitis and died. No other case was known in the foundlings' home or in the hospital to which it was brought. However, in both institutions several other infants and older children developed pemphigus not long afterward. It seems as if the germ causing the exfoliating dermatitis in the infants induced pemphigus in the older children.

Deutsche medizinische Wochenschrift, Berlin

November 23, XLII, No. 47, pp. 1437-1468

58 *The Relations between Tsetse Flies and Trypanosomes. (Glossinen und Trypanosomen.) E. Teichmann.—p. 1437.
59 Dysenteriform Intestinal Disease with Edema. T. Rumpel and A. V. Knack.—p. 1440. Concluded.
60 *Treatment of Bacillary Dysentery. (Zur Behandlung der Bazillenruhr.) O. Wiese.—p. 1443.
61 Typhoid Conjunctivitis. L. Jakovich.—p. 1443.
62 Small Epidemic of Typhus. (Eine kleine Fleckfieberepidemie unter russischen Landeseinwohnern.) E. Vieting.—p. 1444.
63 *Spondylitis of the Cervical Vertebrae. (Malum Rustii.) Hnatek.—p. 1445. To be concluded.
64 *Examination of the Urine of Sick and Wounded Soldiers. (Beitrag zur Untersuchung des Harns von Kriegsteilnehmern.) C. S. Engel.—p. 1448.
65 Indications for Operative Treatment of Abdominal Wounds.—(Chok—Blutung—Peritonitis.) O. Hirschberg.—p. 1451.
66 Hysteria and Fitness for Military Service. (Hysterie und Kriegsdienstbeschädigung.) F. Grünbaum.—p. 1452.
67 Treatment of Venereal Disease in the Army Hospitals. (Die Lazarettbehandlung der Geschlechtskrankheiten.) Zweig.—p. 1453.
68 History of the Medical Certificate System for Soldiers. (Geschichte der Medizin in Köln. Die Entwicklung des militärärztlichen Zeugniswesens.) Haberling.—p. 1456.

58. **Tsetse Flies and Trypanosomes.**—Teichmann presents the present status of our knowledge on this subject. He declares that it seems to be established that the trypanosomes in question are unable to pass through their whole cycle of development unless they have access to tsetse flies. If the latter could be exterminated, these trypanosomes would die off with them.

60. **Kaolin Fails in Treatment of Dysentery.**—This is Wiese's conclusion from his extensive experience. The men took the kaolin with extreme repugnance and complained afterward of sensations of oppression in stomach or bowel or both. He insisted on keeping up the kaolin treatment, notwithstanding these by-effects, until he found that it sometimes caked into hard lumps, and these lumps caused irritation and pain as they were passed along. Sometimes the lumps were as large as a hen's egg and hard as a stone. He then dropped the kaolin entirely, and obtained much better results with the ordinary treatment, thorough evacuation of the bowels, repeated moderate doses of simple tincture of opium, rinsing out the intestines with epinephrin enemas, supplemented by animal charcoal given by the mouth, sometimes associated with bismuth subgallate.

63. **Spondylitis of the Cervical Vertebrae.**—In one of the three cases of Rust's disease reported, the trouble was of rheumatic origin, in the others, syphilis or deposits of urates were responsible. The clinical picture was practically identical in all, and the diagnosis of tuberculous caries seemed certain until involvement of other joints in the first case suggested a subacute form of articular rheumatism, affecting at first exclusively the suboccipital vertebrae. The acute articular rheumatism cleared up the diagnosis in the first case, confirmed by the absence of evidences of an inflammatory process in the spine on roentgenoscopy. Hnatek could find only three analogous cases on record. In all there was considerable wasting and debility. A concomitant apical tuberculous process pointed further to tuberculosis. Careful watch over the other joints finally revealed further encroachment of the rheumarthritis. In Condray's case, differentiation was facilitated by the rheumatism in both parents and by the sudden onset in two days following exposure to cold, one bitter night, near a drafty window. The article is to be continued.

64. **Albuminuria in Troops on Active Service.**—Engel has had the urine examined of every patient admitted to the surgical hospital in his charge, a total of 3,210 men. Albumin was found in 13 per cent. but never in large proportions.

Medizinische Klinik, Berlin

November 5, 1916, XII, No. 45, pp. 1167-1196

69 *Acute Articular Rheumatism. (Zur Aetiologie des akuten Gelenkrheumatismus.) F. Rolly.—p. 1167.
70 Ligation of Veins for Infectious Thrombosis from War Wounds. (Vorbeugende und kurative Venenunterbindungen bei infektiösen Thrombosen im Felde.) Hosemann.—p. 1169.
71 Burns from Shell Scraps. (Ueber Verbrennungen durch das Geschoss.) G. Magnus.—p. 1172.
72 *Success of Parenteral Injections of Milk in Therapeutics. (Ueber den therapeutischen Wert parenteraler Milchzufuhr.) S. v. Dziembowski.—p. 1174.
73 *Treatment of Convalescents from Nephritis. (Zur Behandlung der Nierenkranken.) Robert.—p. 1175.
74 *Buds on Spirochetes Prove Plant Nature. (Spirochaeta pallida—Schaudinn—und Spirochaeta nodosa—Hübener-Reiter.) E. Meirowsky.—p. 1181.
75 *Treatment of Pneumonia in the Light of the History of Medicine. (Die Behandlung der Pneumonie im Lichte der Geschichte der Medizin.) T. Neubürger.—p. 1193.

69. **Etiology of Acute Articular Rheumatism Still a Mystery.**—Rolly here reports from Leipzig the results of extensive experience with large numbers of cases of acute articular rheumatism. In 118 cases at the acme of the febrile stage he found the blood always sterile, inoculating 20 c.c. or more of the venous blood on fluid and solid culture media. In 2 other cases the staphylococcus was found but this was presumably accidental contamination. In another case a streptococcus was isolated, but the case proved to be a viridans sepsis and not rheumatism. With *Streptococcus viridans* sepsis there is liable to be transient swelling of the joints. He does not venture to say that all previously published accounts of bacteria found in acute articular rheumatism are based on errors of technic, but queries whether mixed infection might not have been responsible for the positive findings. The presence of bacteria on the tonsils and not in the interior of the body is no evidence that these bacteria are responsible for the articular rheumatism. He found tonsillitis in 59 out of his 1,450 patients with acute articular rheumatism; 54 had sore throat; 54, pains in the throat; 10 of the patients had a history of recurring sore throat; 2 had had the tonsils operated on, and in 2 there was suppuration in the tonsils at the time. The tonsils were found enlarged and red in 88; in 58 only red; in 133 only enlarged; plugs were visible in the tonsils in 23, and the tonsils were coated in 23. Other parts of the throat were red or swollen or both in 283; there was conjunctivitis in 3 and the conjunctiva was red in 6; 4 had bronchitis, and 1 acute rhinitis. The patients also told that they had been subject to coryza (8); to cough (15); hoarseness (2); ear trouble (3); disturbances in swallowing (10); gastro-intestinal trouble (21), dryness in the throat (2), and 3 had had furuncles. These figures demonstrate that sore throat is the portal of entry for acute articular rheumatism in many cases, as it is of other diseases (nephritis, etc.). But it is evident that other affections of the throat and other organs must also be considered in this respect. In one of the patients acute articular rheumatism developed for the first time three weeks after an operation on the nose.

Rolly presents evidence further to disprove the assumption that acute articular rheumatism is an anaphylactic reaction. This assumption cannot be upheld, he says, so long as it is impossible to induce in animals the joint disturbances; the mere fact that fever can be induced is not adequate proof that this is the explanation of the disease. In this connection Rolly tabulates the serum sickness phenomena observed in 2,122 diphtheria cases at Leipzig; only 5.75 per cent. of all showed any disturbance from injection of antitoxin. A congenital or acquired special susceptibility to alien serum is thus quite exceptional. He also points out that only 57.5 per cent. of those showing any disturbance developed an exanthem, with or without fever, while 33.3 per cent. had merely a

febrile reaction; only in 9.2 per cent. were there any disturbances in the joints, and these were limited to pains in over half. Thus in only 4.8 per cent. of the 122 who showed the slightest disturbance from the antitoxin, was there any tendency to swelling of joints. These figures show the rarity of joint trouble in serum sickness, and hence render it extremely improbable that acute articular rheumatism can be produced by anaphylactic phenomena. But anaphylactic phenomena may occur in its course the same as in any infectious disease.

72. **The Therapeutic Importance of Parenteral Injection of Milk.**—In this communication from the army hospital at Posen, Dziembowski reports encouraging experiences with what he calls "protein body therapy." He emphasizes that the field for therapeutic parenteral serum and albumin injections is being enlarged more and more as it has proved that in many specific parenteral methods of treating disease there is usually also a nonspecific factor. A colon bacillus or pyocyaneus vaccine may work in typhoid as well as a typhoid vaccine, deuteroalbumose in typhus, diphtheria and tetanus, and diphtheria antitoxin or simple horse serum in hemophilia, erysipelas and other dermatoses. The use of milk for the purpose seems particularly promising as this is a mixture of albumin which is derived from the organism itself and its composition is constant. He has treated about 100 patients with intramuscular injections of 5 c.c. of milk, boiled for ten minutes in a water bath. In a few hours afterward there is regularly a chill, of variable intensity, and a rise of temperature from 38 to 39 C. (102.2 F.). The fever may last for a few hours or into the next day, and sometimes there are palpitations, headache, lassitude and depression but these last only for a few hours. No injury of organs, heart or kidneys, was ever observed and except for a little painfulness at the point of the injection no other untoward by-effects. The number of leukocytes runs up to 15,000 or even higher, within a few hours; the increase is greatest in the neutrophils and then in the large mononuclears, while the lymphocytes show little increase or a decline.

His experiences with the method were decidedly favorable, especially with septic war wounds, in four cases of severe erysipelas, in tuberculous bone and joint disease, in three of actinomycosis, and in large numbers of fractures. In the surgical tuberculous cases, with one injection every four days, the process healed within a few weeks after it had been dragging along previously a most tedious course. In the fracture cases, consolidation occurred in certain cases in which there had been previously scant tendency thereto and a pseudarthrosis was feared or had already developed. Good effects were also realized when the milk was injected for its styptic power, aiding in arresting internal hemorrhage or bleeding from mucous membranes or from wounds. In psoriasis the effect was also highly satisfactory, reenforcing the local applications. In one case with extremely severe psoriasis the skin cleared up almost completely in a few weeks under the injection of 5 c.c. of milk, twice a week, supplemented by quartz-lamp exposures and tub baths.

73. **After-Treatment of Acute Kidney Disease.**—Robert describes the way in which he trained convalescents from nephritis so they could resume their duties at the front and stand the army fare and the weather vicissitudes, and the various tests with which he estimated the earliest moment when this was possible.

74. **Demonstration that Spirochetes are Plants.**—Meirowsky reproduces sixty illustrations of spirochetes as published by different authors, all showing bunches in the course of the spirils or actual buds on a stem. Hübener and Reiter regarded these bunches as characteristic merely of the spirochete they recently found as the causal agent of Weil's disease, and hence they named their spirochete the *Spirochaeta nodosa*. But Meirowsky declares that these are buds and that they demonstrate beyond question that spirochetes belong to the vegetable kingdom, as true lateral branches are never found on protozoa while they are characteristic of filamentous fungi. Meirowsky called attention in 1914 to these buds on spirochetes, but his findings were rejected or explained away by others. He insisted further that these buds, when detached from the parent stem, correspond to Much's granula with tubercle bacilli, and this seems now to be definitely established. The spirochetes of syphilis and of Weil's disease, and the bacilli of tuberculosis and leprosy all pass through a granular phase in the course of their existence. This explains the positive results obtained by Hübener and Reiter and also by the Japanese in infecting guinea-pigs with the filtered virus containing no spirochetes, confirming Neisser's and others' positive inoculation of monkeys with filtered syphilis virus. In the granular form the virus is able to pass through the filter. Be this as it may, the fact of the plant nature of the spirochetes now seems to be settled beyond question, he declares, as Koch, Metchnikoff and others have always maintained.

75. **Pneumonia.**—This work reviews the treatment of pneumonia during the last century or two. It states that Broussais regarded local and general withdrawals of blood as the best treatment, using 100,000 leeches in his service during the year of 1819, and during his own last illness having venesection done six times and sixty leeches applied. In 1827, 33,000,000 leeches are said to have been imported into France. Traube in Germany continued this use of venesection and leeches, and in 1849 a physician who had not bled a certain pneumonia patient had to answer in court for this neglect after the death of the patient, but was acquitted. Skoda was about the first to venture to teach that in most cases venesection was, if not harmful, at least superfluous. He advocated it only when a robust patient was suffering from much dyspnea with bloody sputum. In 1852, Neubürger's professor at Bonn advised him to go to Vienna to continue his studies, saying "They are not venesecting there in pneumonia."

One's own observation, he continues, teaches the more favorable course of pneumonia when nothing is done and the case is left entirely to Nature. The pulse may rise and fall, and the fever drop with or without the sweats of the crisis. We understand better the nature of the crisis since we know more of immunology. The outcome depends firstly, on the greater or less resisting power of the heart, hence the importance of the pulse in this disease, and the danger of the disease for infants and the elderly; secondly, on the height of the fever; thirdly, on the involvement of the nervous system, the so-called cerebral erethism of the elderly, and, fourthly, on the extent of exudation in the lung. The patient may recover with most extensive infiltration and may succumb with involvement of only one lobe. The regularity of the cyclic course surpasses that of other diseases, and the earlier the crisis appears the better, as this shows good production of antibodies.

Our task is to watch over the disease uninfluenced by drugs or other measures, keeping the patient in bed and avoiding needless effort till the last trace of infiltration and of fever has vanished. As pneumonia in hard drinkers does better under opium, this should be given to ward off delirium tremens. Any debilitating diarrhea must be corrected, and the heart action kept good with small doses of digitalis (0.5 gm. in twenty-four hours), caffein, sodium salicylate (0.2 gm. three times a day), and subcutaneous doses of camphor, the work of the heart facilitated by expectorants and the strain from coughing reduced with narcotics, keeping up the strength with liquid or solid food, and, if the fever is very high, two doses of phenacetin in the twenty-four hours, by the mouth or rectum, with ice to the head and cool compresses on the affected side of the chest, or, if this does not help, with packs. Adults do not bear well repeated cool or even tepid full baths; young children seem to bear them better. As the crisis approaches or passes, the nervous system may be involved, the tongue trembling, the tendons twitching and delirium sets in. If this is not a complication from arteriosclerosis of the cerebral arteries, stimulants are indicated, brandy, camphor, mellow wine. The longer the physician practices, so that he can get a bird's eye view of his experiences, the more distinctly he realizes that our medical measures are of incomparably small effect in comparison with the internal processes of the organism. Medical science seems to move in circles, but the circles are like the coils of a spiral, each one bringing us nearer to the truth.

Münchener medizinische Wochenschrift, Munich

November 21, 1916, LXIII, No. 47, pp. 1649-1684

76 *The Arsenic in Lead Projectiles and Its Possible Toxic Action. (Die toxische Rolle des in Bleigeschossen enthaltenen Arsens.) L. Lewin.—p. 1659.

77 *Absorption of Air through the Stomach Walls. (Ueber Magenatmung beim Menschen.) A. Ylppö.—p. 1650.

78 *The Crop of Newly Born Shows no Deterioration from the War. (Zur Frage der Kriegsneugeborenen.) A. Tschirch.—p. 1650.

79 *Syphilitic Partial Heart Block. (Herzsyphilis mit Adams-Stokesschem Symptomenkomplex, ausgezeichnet durch Tausende von epileptiformen Anfällen.) A. Holterdorf.—p. 1651.

80 *The T Peak in the Electrocardiogram. (Ueber die Finalschwankung des Elektrokardiograms.) H. Gerhartz.—p. 1655.

81 *Arrest of Hematemesis with Blood Platelet Extract. (Stillung einer schweren Magenblutung mittels Coagulen.) F. Brautigam.—p. 1656.

82 Later Outcome of War Wounds of the Lungs. (Das spätere Schicksal der Lungenverletzten.) D. Gerhardt.—p. 1669.

83 *Endurance with Kidney Disease. (Kriegsverwendbarkeit der Nierenkranken.) Geigel.—p. 1671.

84 Treatment of Contractures. (Kontrakturenbehandlung.) J. Overgaard.—p. 1671.

85 Swinging a Weight in Treatment of Joints. (Pendeln unter gleichzeitiger Extension.) v. Baeyer.—p. 1674.

86 Spring Splint to Ward Off and Treat Talipes Equinus. (Eine Schiene zur Vorbeugung und Behandlung der Spitzfusskontrakturen.) Moeltgen.—p. 1675.

87 Stains in Pencil Form for Microscopic Sections. (Färbung mikroskopischer Präparate mit Farbstiften.) E. Friedberger.—p. 1675.

88 Various Uses for the Roller Couch. (Verschiedene Verwendungsmöglichkeiten des Prausnitzschen Rollagers.) W. Prausnitz.—p. 1676.

89 *Nerve Blocking in the Field. (Ueber Leitungsanästhesie im Felde.) H. H. Schmid.—p. 1677.

90 Difference between Gas Phlegmon and Gas Gangrene. (Worauf beruht der Unterschied in der Mortalität des Gasbrandes im Frieden und im Krieg?) L. Zindel.—p. 1678. (Zur Frage der Metastasenbildung bei Gasgangrän.) G. Ranft.—p. 1682.

91 Treatment of Fractured Jaw. (Zur Behandlung schlecht geheilter Kieferbrüche.) Walkhoff.—p. 1680.

92 Tardy Tetanus Relapse. (Fall von Tetanusrezidiv nach 5 Monaten.) Heichelheim.—p. 1681.

93 Roentgen Localization of Foreign Bodies. Baath.—p. 1682.

94 Chronic Rhinitis. Handkerchiefs as Source of Reinfection. W. Austerlitz.—p. 1683.

95 *Lice in Transmission of Relapsing Fever. Prüssian.—p. 1683.

76. **The Toxic Action of the Arsenic in Lead Projectiles.**—Lewin has found that the lead and antimony alloy used in making shrapnel balls is liable to contain from 1 to 3 per cent. arsenic, and he has been investigating the possible toxic action from a shrapnel ball in the tissues. An ordinary ball weighing 10 gm., containing 8 per cent. antimony with about 14 mg. arsenic, was chopped into 100 pieces and submitted to the action of hydrochloric acid or olive oil. The results showed that such balls in the stomach are not liable to prove toxic but, embedded in the tissues, the alkaline juices act on the projectile and release the arsenic. But even here the arsenic would be carried away and harmlessly eliminated. On the other hand, the danger from the lead is paramount and always serious. The lead is comparatively soluble in the body juices and fats, while it is retained and stored up in the nerves and brain and is liable to induce manifold symptoms.

77. **Absorption of Air in the Stomach.**—Ylppö experimented on himself, introducing given amounts of gas or air into his stomach. He found that it was evidently absorbed by the stomach walls, the alveolar air promptly showing the effect. Further tests established that carbon dioxid and oxygen diffused into the blood through the walls of the gastro-intestinal tract, while common air did not diffuse and was passed along as flatus.

78. **War Babies.**—Tschirch reports statistics from Jena which show that the infants that have been born during the war average as well in weight as during peace times. Also that lactation does not seem to be modified by the scarcity of fat and albumin in the food.

79. **Gummas in the Heart.**—The patient in the case described was a man of 44 and he presented the Adams-Stokes syndrome and also attacks like the petit mal of epilepsy, completely losing consciousness, these brief attacks occurring forty or fifty times an hour, day and night, so that in the five weeks the man was in the hospital he had nearly 25,000. Toward the end the intermissions grew so short that the attacks were practically continuous. No benefit was apparent from mercurial and iodid treatment and the condition was considered too precarious to attempt salvarsan. At necropsy several gummatous nodules were found in the heart but the auricular-ventricular bundle showed merely small-cell infiltration between the muscle fibers and no gummatous changes. The auricle beat three or four times to the ventricle's once, but the regular ratio was preserved, the heart block not being complete. The only case approaching this in respect to the frequency of the epileptiform seizures was one of Zong's with 200 in twenty-four hours, but in the present case there were 800. With the onset of the attack, the ventricle action seemed to be suspended completely for from five to forty-five seconds, indicating that the heart block had become total during this phase, but partial conduction was soon restored again. The arrest of the ventricle action suggests that a reflex from the heart, shutting off the blood from the brain, was responsible for the attack. Disturbances of this character might retrogress under specific treatment, but the condition is generally too far advanced when the case reaches the physician. If the assumption is correct that other fibers might vicariously conduct the impulse, even with actual heart block, then antisyphilitic measures might prove successful even in quite pronounced cases.

80. **The Ventricle-Systole Wave of Electrocardiogram.**—Gerhartz states that the final T peak occurs during the systolic phase of the heart action but does not necessarily end with it. Straub recently analyzed the electrocardiogram in a case of paroxysmal auricular tachycardia, and found that the normal interval of 0.39 was reduced to 0.25. He regarded it as impossible for this abnormal shortening of the interval to be due to a more rapid course of the systolic contraction, or even for it to parallel the latter. This view is confirmed by the findings in a normal man described by Gerhartz. In rest, the diagram shows a longer interval between the R and the T peaks but the T peak extends farther. Immediately after physiologic exercise, the T peak begins earlier and ends before the corresponding end of the T peak at rest, while the following interval is not much more than a third of the same interval in repose, and the P peak is only about two thirds as long. The systole is thus materially shortened under the influence of mild physiologic exercise. It seems thus to be established that the T peak can change independently of the R or ventricle peak, and not parallel the duration of the systole. The shortening of the systole with paroxysmal tachycardia is thus merely an exaggeration of normal relations.

81. **Arrest of Gastric Hemorrhage with Extract of Blood Platelets.**—After a gastro-enterostomy the patient had profuse hemorrhage from an old and supposedly healed ulcer. While the abdomen was open, the blood platelet extract was injected into the stomach, in a 10 per cent. solution; the hemorrhage ceased at once and there has been no return during the month to date. The danger of arousing an old healed ulcer should be borne in mind in operating on the stomach, and some of this extract might be injected or swallowed as a preventive.

83. **The Endurance in Kidney Disease.**—Geigel naturally discusses this subject from the standpoint of fitness for military service. The quite chronic forms of interstitial nephritis and true contracted kidney, which have developed insidiously, do not exclude army service unless there are acute attacks of parenchymatous inflammation. Prophylactic vaccinations should be avoided with kidney affections of all kinds unless an epidemic threatens. Not much endurance can be counted on when there has been pulmonary edema, uremia or cerebral hemorrhage at any time, as also when the fundus of the eye shows changes or the blood pressure is 180 or over. Garrison duties are permissible when the blood pressure is between 160 and 180. The rise in blood pressure under the influence of war conditions is not to be dreaded when the individual is young or middle aged, but arteriosclerotic contracted kidney excludes even light service.

89. **Nerve Blocking in the Field.**—Schmid has found local anesthesia of the greatest use for the wounded when the injured area is accessible, but when it is deep in the tissues

the nerve blocking technic is preferable and he is enthusiastic in his commendation of it. With the paravertebral technic it is possible to induce analgesia for the entire trunk and neck. For parasacral anesthesia he injects 2 c.c. of a 1 per cent. solution of novocain and epinephrin into the sacral nerve as it emerges and runs along the sacrum. The needle is introduced about 2 cm. to one side of the sacrococcygeal joint. This is repeated on each side. The second and fourth sacral nerves are injected under the guidance of the finger in the rectum, the needle feeling its way along the sacrum. If the phrenic nerve is carefully avoided, he thinks there is no danger from these nerve-blocking technics.

95. **Lice in Transmission of Relapsing Fever.**—THE JOURNAL mentioned on page 155 Töpfer's statements to the effect that while lice are an important agent in the transmission of relapsing fever yet it is not by their bites but only by their being crushed on the skin that the spirochetes find their way into erosions from scratching. Prüssian's experience has confirmed this assumption in every respect, and it offers an explanation for the previously inexplicable immunity to relapsing fever often displayed by attendants and others with cleanly, hygienic habits.

Wiener klinische Wochenschrift, Vienna

November 2, 1916, XXIX, No. 44, pp. 1385-1416

96 *Syphilitic Aorta Disease. L. v. Korczynski.—p. 1385. Continued.
97 Various Forms of Paratyphoid B. E. Sluka and R. Pollak.—p. 1390.
98 *Eosinophilia after Vaccination against Typhoid. (Zu den zytologischen Veränderungen nach der Typhusimpfung.) M. Labor.—p. 1393.
99 Changes in the Stomach with Paratyphoid. (Ueber gastritische Veränderungen bei Paratyphus.) T. Frankl and M. Benkovic.—p. 1394.
100 Lumbar Puncture "Cures" Certain Types of War Hysteria. T. v. Podmaniczky.—p. 1396.
101 *Typhus. (Zur Epidemiologie und Prophylaxe des Fleckfiebers.) J. Fonyo.—p. 1397. Concluded.
102 Atypical Variola; Two Cases. (Atypische Blatternfälle.) Wiener.—p. 1413.

96. **Syphilitic Aorta Disease.**—Korczynski reviews recent literature on this subject and reports data compiled in Bosnia and Herzegovina during the last two years. At the Sarajevo hospital there were during this period 251 cases of disease of the cardiovascular apparatus, exclusive of pericarditis, and in nearly 22 per cent. syphilis was present. Half of the fifty-four patients were between 40 and 50, but there was one of 15, one of 18, and two were between 20 and 30, with four between 60 and 65. Over 70 per cent. were from cities. The shortest interval between infection and the aorta affection was three years; from fifteen to thirty was the average. Grau has reported a case developing forty-one years after infection. The leukocyte picture was modified in nearly every case, the small lymphocytes being abnormally numerous. This in itself suggests the syphilitic nature of the trouble.

98. **Modification in the Blood After Vaccination Against Typhoid.**—Labor found abnormally high eosinophil count in a number of men during an epidemic of scurvy. Study of this eosinophilia demonstrated finally that it was a tardy phenomenon following vaccination against typhoid. In ninety healthy men and wounded vaccinated against typhoid but who had not been given antitetanus serum, he found no eosinophilia the first month; it was present in 20 per cent. the second month; in 57 per cent. in the third month; in 43 per cent. in the fourth, with the maximum eosinophilia of 21 per cent. in two of these cases. By the sixth month no eosinophilia was evident; in the seventh month slight eosinophilia was apparent in a few, and none after this. The lymphocytosis of the first period gives way to this eosinophilia which persists an astonishingly long time. No connection between it and the agglutinating property was evident. In two cases of typhoid occurring in the second and fifth month the eosinophils were much below the normal figure.

101. **Typhus.**—Fonyo's article was reviewed in these columns January 13, p. 156, abstr. 96.

Gazzetta degli Ospedali e delle Cliniche, Milan

November 23, 1916, XXXVII, No. 94, pp. 1473-1488

103 *Sweats in Meningitis not Connected with the Fever. (Gli accessi sudorali nella meningite della base.) G. A. Pari.—p. 1477.

November 26, No. 95, pp. 1489-1504

104 Localization of Foreign Body in Pleura by Percussion of Base of Thorax. S. Gangi.—p. 1492.
105 Treatment of War Fractures. (Sulla cura ed in specie sulla immobilizzazione delle fratture di guerra.) R. Mosti.—p. 1494.

November 30, No. 96, pp. 1505-1520

106 Typhoid plus Tetragenus Infection. C. B. Farmachidis.—p. 1508.

103. **Sweats in Meningitis.**—Pari calls attention to sudden universal sweats in basal meningitis, independent of the course of the fever. They seem to be connected with the motor phenomena, as is evident from the details of two typical cases related, the sweats coming on and subsiding with the symptoms from irritation of the cerebral nerves.

Policlinico, Rome

December 3, 1916, XXIII, No. 49, pp. 1417-1449

107 Mutilating Operations for War Wounds. (Le operazioni demolitive nei grandi traumatismi di guerra.) M. Francini.—p. 1417.
108 *Psoriasis after Emotional Stress and Trauma. (Sulla cosidetta psoriasis emotiva e traumatica.) C. Vignolo-Lutati.—p. 1422.
109 *Fever with Mastoiditis. (Il valore del sintoma febbre nella diagnosi e nelle indicazioni operative della mastoidite acuta e subacuta.) G. Bilancioni.—p. 1424.

December 10, No. 50, pp. 1453-1486

110 *Strangulated Femoral Hernia. (Di 5 casi di ernia crurale strozzata. Considerazioni intorno alla patogenesi dell'ernia crurale in uno di questi casi.) A. Miliani.—p. 1453.
111 *Emergency Hemostasis in War Wounds. (Emostasia provvisoria nelle ferite in prima linea di guerra.) R. Sacco.—p. 1458.
112 Technic for Vaccination against Typhoid. L. Tatarelli.—p. 1460.
113 Malaria among the Italian Soldiers. (La malaria fra i nostri soldati.) P. Timpano.—p. 1461.
114 *The Eye Affections of Scientists. (Intorno al mal d'occhi che rese cieco L. A. Muratori.) G. Bilancioni.—p. 1470.

108. **Psoriasis from Emotional Stress.**—Lutati has been impressed with the numbers of cases of psoriasis among the soldiers in Italy, the same as Gaucher in France. It seems to develop after a nervous shock, a violent emotion or trauma, but Lutati is convinced that this can occur only when there was already a possibly latent tendency to the disease.

109. **Fever in Mastoiditis.**—Bilancioni cites some typical cases to illustrate that fever is by no means a constant accompaniment of even very severe cases of mastoid disease, even in young children.

110. **Pathogenesis of Femoral Hernia.**—Miliani reports some cases of femoral hernia which sustain T. Turner's views as to the mechanism of the development of this form of hernia, as published in 1914.

111. **Emergency Hemostasis for War Wounds.**—Among the measures advocated, Sacco calls attention in particular to immediate suture of the skin as a means to control bleeding from a wound made by bullet or shrapnel ball, without wasting time in seeking for the exact source of the lesion. He found that the hemorrhage promptly stopped as soon as the skin wound was sutured. In the cases described the wounds had been dressed on the firing line, but the oozing of blood kept up until the skin was sutured.

114. **Ocular Anomalies that Lead to Blindness.**—Bilancioni cites a number of eminent scientists in different lands who lost their eyesight, saying that cataract does not seem to be more frequent among scientists and professional men than among other classes of the population, but glaucoma, detachment of the retina, sclerochoroiditis (especially in myopic eyes), retinal hemorrhages and other intra-ocular disturbances in circulation occur in far larger proportion among persons of a studious tendency than among others. He says that not a few professors in the universities of Italy have become blind from optic neuritis, retinal hemorrhage or detachment of the retina.

Siglo Medico, Madrid

October 28, 1916, LXIII, No. 3281, pp. 689-704

115 *Sarcoma of the Choroid. B. Castresana. Conclusion. p. 691.
116 Treatment of Urticaria. E. de Oyarzabal.—p. 694.
117 Phlebotomus Mosquitoes in Spain. Pittaluga.—p. 695.

115. **Sarcoma of the Choroid.**—The first part of this article was summarized in THE JOURNAL, Dec. 2, 1916, p. 1705.

Hospitalstidende, Copenhagen

November 29, 1916, LIX, No. 48, pp. 1157-1180

118 *Idiopathic Perirenal Hematoma. C. Tage-Hansen.—p. 1157.
119 *Experimental Research on Bile Peritonitis without Perforation of the Biliary Passages. (Studier over Galdeperitonit uden Perforation af Galdevejene.) A. Blad.—p. 1163. Commenced in No. 47, p. 1133.

118. **Idiopathic Perirenal Hematoma.**—In Hansen's patient, a secundipara of 35, the hematoma entirely encircled the kidney, but no cause for it could be detected on direct inspection of the kidney, pelvis or suprarenals. Recovery was soon complete after draining the blood away. In some of the twenty-three cases on record nephrectomy was done, in others the hematoma was merely drained. All died of the seven not given operative treatment, and four of the sixteen operated on. The diagnosis was made beforehand in only three cases.

119. **Experimental Bile Peritonitis without Perforation of Biliary Passages.**—Blad gives the details here of his work on rabbits and twenty dogs. He thus demonstrated that colloids are unable to pass through the gallbladder walls, but that crystalloids pass readily through them. Hence if the gallbladder contents become digested by ferments in connection with bacterial action, the bile can pass readily through the walls of the biliary apparatus without perforation. He explains that the ferments involved are probably derived from the pancreas.

Hygiea, Stockholm

1916, LXXVIII, No. 22, pp. 1681-1760

120 *Hemangiomas and Horn on Foot. (Ett fall av multipelt kavernöst hämangiom kombinerat med hudhorn.) A. Troell.—p. 1683.
121 Medical Experiences in Persia. (Några minnen och erfarenheter från Persien som läkare vid gendarmeriet.) C. Carlström.—p. 1692.

120. **Multiple Hemangiomas on the Foot.**—The patient was a girl of 8 and there were several tumors of the hemangioma cavernosus type at various points on the foot, and the whole leg was larger than its mate. The anomalies were evidently congenital, including a hornlike excrescence on the big toe. Under operative measures followed by radium exposures approximately clinical normal conditions were restored.

Norsk Magazin for Lægevidenskaben, Christiania

December, 1916, LXXVII, No. 12, pp. 1525-1660

122 *Drainage of the Peritoneum in Peritonitis. N. Barth.—p. 1525.
123 *Sacral Anesthesia to Relieve Pruritus. (Sakralinjektioner ved pruritus i genito-analregionen.) W. Holland.—p. 1557.
124 *Corneal Cyst with Secondary Glaucoma. (Korneoskleralcyste med epitelindvandring til camera anterior og sekundært glaukom.) S. Hagen.—p. 1567.
125 *Polypous Adenomas in Gastro-Intestinal Tract. (Polypøse adenomer i ventrikel og tarmkanal.) R. Ingebrigtsen.—p. 1578.
126 *Pathology and Treatment of Traumatic Aneurysm. C. Johannessen (Petrograd).—p. 1586.
127 *Herpes Zoster. (Motoriske og sensible forstyrrelser ved Herpes zoster.) V. Magnus.—p. 1612.

122. **Drainage with Peritonitis.**—Barth reviews the literature, 1912 to 1915, on the subject of draining the peritoneum in peritonitis. The cases of appendicitis in his own experience (Schilling's service, Christiania) accompanied by peritonitis are tabulated, the sixteen one-page tables thus giving an oversight of the outcome with and without drainage and with and without rinsing. Statistics from other clinics are cited, the length of stay in the hospital being also regarded. The summary conclusion from the whole is that the outcome is better when diffuse peritonitis is treated with drainage, but localized peritonitis does not seem to require it, the results being practically the same whether drains are used or not.

123. **Sacral Anesthesia for Genito-Anal Pruritus.**—Holland remarks that in cases of genital or anal pruritus rebellious to all other measures, great benefit can sometimes be obtained from temporary anesthetization of the region. The itching and the scratching keep up a vicious circle; let this be broken once and conditions may right themselves. As a comparatively simple and extremely effectual measure for the purpose, he commends sacral injection of a weak anesthetic solution. He describes six typical cases of pruritus of the genito-anal region in men between 30 and 66. The itching was alleviated by one injection and subsided entirely after a second or third. There was complicating eczema in some of the cases, and the pruritus was so intense in one case that sleep was impossible. This patient had obtained no relief from local applications and Roentgen exposures, but the pruritus was practically conquered with four sacral injections, the first two of 20 c.c. of 0.9 per cent. saline plus 0.1 and 0.15 gm. novocain; the last two of 48 c.c. of water with 0.4 gm. novocain. Once in a great while there is a little itching still, but it is mild and transient. In another case the itching showed no modification after sacral injection of 48 c.c. of 4.5 per cent. saline containing 0.24 gm. novocain. Eight days passed with no apparent improvement; then suddenly the pruritus ceased, and there has been no return of the itching during the ten months to date. This patient was a clerk of 30 and the pruritus had tormented him for two years, involving the entire genito-anal region, but he has been entirely free from it since the eighth day after the injection last February. Holland reiterates that the practical result harmonizes with the theoretical reasoning, the benefit being constant and striking, while the injection can do no harm at the time or later. The effect seemed better when water was the vehicle rather than saline, and when from 0.2 to 0.3 gm. novocain was used. In some of the cases the anesthesia in the region was not complete but the pruritus was relieved. At first he used but little fluid, but later injected more until he felt a resistance. With a little overpressure the fluid works its way into the nerves better. In three of the cases the pruritus might be regarded as of the senile type, the men being from 60 to 66; the others were in the thirties. The technic was that described by P. Bull and W. Enderlé (mentioned in THE JOURNAL, Aug. 14 and Sept. 25, 1915, pp. 658 and 1147. It is practically the same as Cathelin's epidural injection.)

124. **Corneal Cyst.**—The boy of 10 had a typical corneal-sclerotic cyst in the right eye. Epithelium cells had invaded the anterior chamber and secondary glaucoma developed. The microscopic findings in the enucleated eye are reproduced.

125. **Gastro-Intestinal Polyposis.**—Ingebrigtsen's report is based on sixteen cases of polypous adenoma in the stomach, the patients all over 40, and one case of intestinal polyposis in a man of 36. In two of the stomach cases there was also a cancer in the stomach, and in one case there was actual gastric polyposis.

126. **Traumatic Aneurysm.**—Johannessen reports practical experiences in the war and much experimental research on dogs to determine the effect on the venous circulation of ligation of the corresponding artery. The venous circulation dropped very low after ligation of an artery. The animals were all under the influence of a general anesthetic. Lying on the back the pressure in the femoral vein after ligation of the femoral artery was 7 mm. mercury; in the Trendelenburg position it was from 4 to 2 mm.; after compression of the femoral artery, it was 1.5 mm., and after compression of the abdominal aorta only from 0.5 to 0 mm. or below. This low pressure sucks the blood from the arterial collaterals directly into the veins. The larger the artery, the greater the drop in the venous pressure, and this hinders the development of good collateral arterial circulation. These and other experiments related teach the lesson that ligation of the vein, after ligating the corresponding artery, promotes the arterial collateral circulation.

127. **Herpes Zoster.**—Magnus has been investigating the sensory and motor disturbances accompanying or following herpes zoster, and reports here seven cases in which there were motor disturbances. In the eight other acute cases and twenty-three convalescents there were no motor symptoms. He and others have published a few necropsy reports showing disseminated foci of myelitis following herpes zoster, and in one case of herpes zoster he found diplococci in a round cell infiltrate in the anterior grey cornu. The eight cases with motor disturbances are described in detail, with illustrations. The weak muscles corresponded to the region innervated by the nerve involved in the herpes zoster. The region that had been involved in the herpes zoster was often left also with sensory anomalies for a few months.